

**2014 MINING  
LEKGOTLA:**  
The way forward for  
the mining industry

**ZIMELE:  
A 25-YEAR  
EVOLUTION**

Today a global model for  
creating sustainable futures

**THEMBA MKHWANAZI:**  
CEO OF ANGLO AMERICAN  
COAL IN SOUTH AFRICA  
Key objectives and goals  
for 2015 and onwards



JACOB DIALE  
Bursary Recipient  
Anglo American Employee

Meet Jacob Diale who received a bursary from Anglo American, which enabled him to study mining engineering - an achievement that made his parents, both teachers, extremely proud. Now he is not only a member of the graduate programme BLAST, but he has the opportunity to continue to learn and be an example for others as his parents were to him. In 2013, Anglo American awarded 537 deserving students like Jacob with bursaries because we know that by developing the potential of young South Africans we are investing in something truly valuable.

[www.angloamerican.co.za](http://www.angloamerican.co.za)

**THE TRUE VALUE OF MINING IS FOUND NOT ONLY IN THE GROUND BUT ALSO IN THE CLASSROOM**

# RECOGNISING THE PAST, MOVING INTO THE FUTURE



KHANYISILE KWEYAMA  
EXECUTIVE DIRECTOR:  
ANGLO AMERICAN  
SOUTH AFRICA

This year as South Africans, we are privileged to be celebrating 20 years of our democracy. On the one hand, we can be proud that the mining industry stands as one of the most important foundations of our country's economy – while on the other, we must recognise that mining continues to be challenged by complex socio-economic problems.

As an industry we need to understand and acknowledge our history, however uncomfortable, if we're to properly address the challenges that continue today. Only if we do that, will we move forward as a sector and as a nation.

At Anglo American South Africa we are working to help restore confidence in our industry and in the country. It is our responsibility to help SA address the legacies of its past by helping to alleviate the triple challenges of poverty, inequality and unemployment.

Hence in this issue of *The A Magazine*, one of the tools we use to communicate with our stakeholders, we showcase some of our work in tackling these challenges and outline our strategy for the future. The diversification of our resources portfolio signals our commitment to growing a global business with its roots still firmly in SA. This positions the Group for sustainable long-term growth so that we can continue contributing to building SA's economy.

In terms of addressing legacy issues, our strategy has always been to partner with others to ensure success. The launch of a platinum fuel cell (see page 36) in a rural electrification project on the outskirts of Kroonstad in the Free State is one example of how we are making a difference. By partnering with other players in the development field and using innovation in platinum technology, Anglo American can play a part in bringing electricity to the 1 million people in rural SA who do not yet have it.

This partnership is just one of the ways we are tackling socio-economic issues in our areas of operation. We cannot do it alone. In order for companies to contribute to the long-term prosperity of SA and to support government in achieving its development goals, there must be greater dialogue and understanding between government, labour, communities and the industry.

While we recognise that these issues are complex and have a long history and legacy, we cannot ignore the significant progress made in the 20 years since the advent of democracy and the 10 years since the Mining Charter came into effect.

For example, in 2013 we spent R671 million on socio-economic development initiatives and R32.4 billion in procurement spending, excluding purchases from state-owned enterprises which went to historically disadvantaged South African-owned businesses. Many

**“As an industry, we need to understand and acknowledge our history, however uncomfortable, if we're to properly address the challenges that continue today. Only by doing that can we move forward as a sector and as a nation.”**

of these enterprises exist thanks to the work of Zimele, our enterprise development arm.

We are committed to doing more. It is no coincidence that almost all of our socio-economic development initiatives are in harmony with the priorities spelt out in the National Development Plan – the path our industry and our country must follow if we are to fulfil our potential and ensure better lives for all South Africans.

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Anglo American Group's Mine Closure Toolkit is helping to better manage the end-of-life mine planning process; through a strategic partnership Anglo American has launched a support programme to strengthen municipal institutional capacity; non-governmental organisation Soil for Life has been given a helping hand by Anglo American's Chairman's Fund; new fuel cell technology is generating electricity in remote areas.

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Thomas Ruwati tending to the produce at Soil For Life, Constantia in the Western Cape

# EDITOR'S NOTE

It's always inspiring to read about entrepreneurs and what they're doing to build businesses, create jobs and contribute to building a stronger economy. In this issue of *A Magazine*, we explore how Anglo American has supported hundreds of small businesses over 25 years through its Zimele development initiative (see page 8). The programme has evolved to become a major force in the field of enterprise development and the Zimele model is being rolled out globally in other emerging nations where Anglo American operates. We also hear from small business expert Pavlo Phitidis on page 26, as he expresses his view on how big businesses and government need to work together to use enterprise development to further the developmental agenda.

Jade Davenport, an esteemed writer in the mining world, provides a fascinating preview of her new book *Digging Deep*, a complete history of South Africa's phenomenal mineral revolution, spanning more than 150 years. Look out for the book giveaway on page 22.

**It's always inspiring to read about entrepreneurs and what they're doing to build businesses, create jobs and contribute to building a stronger economy.**

Another article of interest is an overview of the Mining Lekgotla, which brought together the main stakeholders in the mining sector to debate some of the biggest challenges to the mining industry (page 14). We also investigate how a project management tool developed by the Anglo American Group is now being used by the mining industry to better manage mine closures (page 32). Plus, find out how a new state-of-the-art fatigue management centre is helping improve on-the-job safety for miners at Kumba Iron Ore's Kolomela Mine (page 37).

Settle in, take some time out and enjoy this edition of *A Magazine*.



Photographer: Michelle Wastie. Grooming: Lindsey Swart @ Red Hot Ops

**MOOKETSI MOCUMI**  
EDITOR

**HOW TO USE THE QR CODES:** To use QR codes conveniently, you must have a smartphone equipped with a camera and a QR code reader/scanner application feature. Luckily, the newer smartphone models available today often have an app pre-installed on them. However, if you don't have an app, they are readily available for download. Open the app on your phone, do your best to steady your hand while the QR code is centred on the screen and, once it's finished scanning, whatever information (videos, webpage URLs, etc) was stored in the QR code will appear for your viewing pleasure.



**Competition terms & conditions:** Competition entrants must be at least 18 years of age. Prizes are not transferable and may not be converted into cash.

Winners are chosen randomly, unless otherwise stipulated. The judges' decision is final and no correspondence will be entered into. Prize-winners will be notified after the closing date. The competition closes on 23 January 2015.

# GOOD AS GOLD

At this year's Gold Quill Awards, the International Association of Business Communicators (IABC) again recognised Anglo American communicators for excellent work by honouring them with three Gold Quill Awards of Merit.



Ghrethna Kruger, Nelmarie Schutte, Gert Schoeman and Ian Donabie.

The Gold Quill programme celebrates the shining stars in global business communication. These illustrious awards, which took place in June, are regarded as the "Oscars" of communication management globally. Kumba's Ghrethna Kruger was recognised in the Communication Research Management division for the Kumba 2013 Corporate Communications Audit, while Nelmarie Schutte was the winner in the Safety Communication category for phase two of the Kolomela mine fatigue management campaign in host community schools. Nelmarie and Ghrethna were also winners last year, when Kumba received three Gold Quill Awards of Excellence and one Award of Merit.

Group Corporate Communications'

Ian Donabie received a merit award in the category of Communication Skills: Audio-Visual for the Mark Cutifani video diaries, which provided an opportunity for the entire Anglo American workforce to learn more about our CEO. They shadowed him on visits to Chile, Australia, Brazil and South Africa and imparted Mark's character, values and management style, while also providing insights into his daily job and business priorities.

"Winning an IABC Gold Quill means your efforts are judged to be on par with the best in the world. Knowing that is worth a lot more than yet another trophy in the cabinet," said Gert Schoeman, Kumba's corporate communications manager, who accompanied the winners to Toronto in Canada.



## A MILLION – AND COUNTING!

This year saw Forevermark – the De Beers Group of companies' diamond brand – celebrating a million inscriptions.

The milestone was reached on 28 April as the one millionth Forevermark diamond was inscribed at the Forevermark Diamond Institute in Antwerp, Belgium. Stephen Lussier, Forevermark CEO, said it was a "significant day in Forevermark's young history". "Inscribing a million Forevermark diamonds in the six years since launch is a huge achievement," he continued, "and is testament to the appeal of the brand among a growing number of consumers." Only when a diamond has met Forevermark's strict standards can it be inscribed with the individual inscription number and the Forevermark icon. The inscription represents the brand's promise of a commitment to rare, beautiful and responsibly sourced diamonds. "The fact that every inscription number is unique and always identifiable as your very own adds to the allure of our brand offering," said Stephen. Forevermark will be launching a new Forevermark Diamond Institute facility in India in early 2015 in order to meet the high demand for inscription and grading services.

## GROWING STRONGER

A combination of the words "fungi" and "coal", fungcoal is the discard coal bioconversion technology that promises "to do in six months, or one growing season, what nature does in 60 years".

Developed and patented by Anglo American's coal business in South Africa, it will soon be used on a larger scale.

The R7.5 million research project was undertaken in partnership with Rhodes University's Institute for Environmental Biotechnology and has the potential to significantly improve the quality and rate of rehabilitation on discard dumps and open-cast mine land. Fungcoal has been comprehensively trialled at Greenside, Landau and Kleinkopje collieries.

"Certain fungi have the ability to break down and liquefy coal that's been exposed to the elements. When accompanied by other micro-organisms, they create humic and fulvic acids, natural fertilisers that are regarded as the building blocks of soil fertility and plant life," says Henk Lodewijks, environmental manager for Coal South Africa, Industry.

"Discard coal is used as a medium on which certain grass species can grow, which means conserving precious and costly topsoil while turning waste into a useful product," he adds.

If the process proves suitable for full-scale application, it will ensure a reduction in the cost of discard dump and open-cast rehabilitation. Improved rehabilitation brings with it a buffer against mining's potential impact on water resources and agriculture. Apart from these benefits, trials have revealed that fungcoal also appears to reduce the compaction (hardening) of soil, a significant challenge in rehabilitating mine land.

"The results in most cases have been excellent and the next step will be to gain a greater understanding of the product's use in other applications," says Henk.



## PROMOTING HEALTHCARE IN THE BROADER COMMUNITY

**ON AVERAGE**  
**92%**  
of employees check their HIV status annually through our voluntary workplace HIV counselling and testing programmes

**MORE THAN**  
**5,000**  
of our employees are receiving HIV care, support and treatment

**OVER**  
**92,000**  
of our employees and contractors underwent voluntary counselling and testing for HIV in 2013

**75%**  
of HIV-positive employees are participating in our HIV wellness programmes, which include preventing tuberculosis

**THE WORLD'S LARGEST**  
workplace HIV/AIDS prevention and treatment programme

**168,201**  
South Africans benefit from our health and welfare investment

**TUBERCULOSIS CONTROL PROGRAMMES**

Our tuberculosis incidence is in line with the South African national average

## GETTING SOCIAL

You can find Anglo American on Facebook, Twitter, YouTube, SlideShare and Flickr.

**Website:** www.angloamerican.co.za  
**Facebook:** angloamericanza  
**Twitter:** @angloamericanza  
**Flickr:** angloamerican  
**Slideshare:** angloamerican  
**LinkedIn:** Anglo American

The Corporate Communications team will manage all social media. Only authorised spokespeople are allowed to post on behalf of the Group. For information or queries, email: socialmedia@angloamerican.com

## JOIN THE CONVERSATION

**South Africa's premier showcase of sustainable enterprise and supplier development, the Enterprise Development Conference, took place on 27 and 28 October.**

Bringing together leading enterprise development (ED) and supplier development (SD) practitioners, corporate South Africa, entrepreneurs and members of government, the conference acts as a platform for meaningful engagement, debate and networking by inspiring solutions-driven thinking.

This year, the programme was designed to be more than a talk-shop, unpacking critical issues, positing new solutions and crafting new stories. The two-day think-tank unpacked a number of key themes, including:

**The challenge of serial entrepreneurship:** Moving SMEs beyond support to independence and sustainability.

**Amplifying economic impact:** Tapping into the potential of enterprise and supplier development.

**Of instigators and initiators:** The power of challenging the enterprise development status quo.

The conference was held at Gallagher Estate in Midrand, Johannesburg.

For more information, visit: www.edconference.co.za.



# MASTERS OF THEIR FATE

Anglo American's enterprise development arm, Zimele, has evolved over the past 25 years to help thousands of businesses get off the ground and assist communities to become independent through entrepreneurship.

Having invested more than US\$100 million over the past 25 years in small businesses in the mining sector and beyond, Zimele has become a global model of how companies can create sustainable futures for the people in the communities where they operate.

Anglo American set up Zimele in 1989 to enable the Company to invest in small businesses and integrate them into its supply chain.

"This, of course, was before broad-based black economic empowerment became a legislated mandate," says MD of Zimele, Hlonela Lupuwana. "It was a socio-economic imperative, a way of enabling Anglo American to run effectively in a complex socio-political and economic context."

Today, 25 years later, the Zimele model has been replicated in other countries where Anglo American operates and has supported globally more than 76,000 jobs and created more than 47,000 enterprises since 2008, improving the lives of hundreds of thousands of men, women and children.

## EVOLVING TO MEET CHANGING NEEDS

When Zimele was set up, much was drawn from the concept of the "dual-logic economy" in which leading companies, such as Sony, Canon and Toyota, were supported by a network of small

businesses that produced components for their final products.

The winning formula was a combination of the strong first-logic economy – world-class business, size, technology and innovation – supported by the second-logic economy with its entrepreneurial focus and energy in providing particular services or products.

"Anglo American based its enterprise development efforts on this model, attributing much of its success to the transformation of its supply chain by outsourcing certain services to the small- and medium-enterprise sector," adds Hlonela.

Its first fund, the Supply Chain Fund, was seeded in 1989. In 2003 the Anglo American sefa Mining Fund was established to promote emerging miners with prospecting licences, accelerating up the value curve to achieve fundable business cases.

Over time, Zimele evolved to go beyond the supply chain and even the mining sector. In 2007 it launched the Community Fund, whose mandate was to support any small and medium-sized enterprises (SMEs) operating close to Anglo American's mining sites around South Africa. Other Funds have also since been established to expand Zimele's product offering, particularly public private partnerships. Since then Zimele has expanded even further, with the concept being used globally to launch enterprise development initiatives in



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01 Based in Kathu, Tshimo Gardens is a domestic landscaping company that's partly owned by Piet Wilson and Happy Olyn. 02 A Grade Six maths and science class at Westbank No 1 Primary School, Delft: Novosti Buta (PSP facilitator) with Zipehele Manxanga and Odwa Mbombo conducting salt solution experiments. 03 Pierre de Vos is a boilermaker for AEF Mining Services, a beneficiary of the Supply Chain Fund.



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**CASE STUDY**

**CLEAR VISION**

Growing up in Kwa-Thema township in the east of Johannesburg wasn't easy for Luyanda Ngwenya and she always wanted more out of life. Now she runs a thriving business, ICU Eye Care, which provides primary eyecare services and education to disadvantaged individuals with no access to medical aid. Luyanda came up with the idea of providing flexible and affordable payment options for her clients. In addition, she provides workers in the service industry with an "Optometrist in a Container" to help meet their everyday ocular safety needs.

"In the first year of my business, Zimele kick-started my dreams by loaning me the money I needed to purchase critical equipment," she says.

In the third year of running her business, Zimele assigned a business mentor to Luyanda to advise her on all matters relating to business growth and development, helping her work towards her dream of becoming a major player in the field of eyecare.

Her business also manages to give back and sees itself as a sustainable social enterprise. By working closely with the private and public sectors, ICU Eye Care is able to provide quality eye care to previously disadvantaged school children, helping to reduce failure rates and increase academic performance.

"Zimele's become a catalyst for young entrepreneurs," says Luyanda. "It's given them a chance to make their dreams come true and build a better future for themselves and the country."

She believes there's an abundance of young people in South Africa with brilliant business ideas. "All they need is someone to listen and support them in making their businesses come to life," she says.



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experience is that entrepreneurs are more than business people looking to make a profit," says Hlonela. "Very often they're also driven by a vision to promote social progress, create jobs or deliver innovative products and services."

The Company also understands that it needs to do what it can to encourage job creation so that the benefits of mining are felt and recognised by local communities and government stakeholders. This presents a multiplier factor, since for each entrepreneur, there's more than one community member who'll try to emulate them and usually more than one job is supported. This dynamic is key to achieving social stability and long-term growth in communities. It's also critical to deliver the right context for Anglo American's sites to support strong operational and financial performance.

But focusing too narrowly on companies that were already poised to develop as a result of the mining sector's growth would only perpetuate the inequalities in the economy, which could increase tension and ultimately affect business performance and economic growth.

"Over time we've grown to support the broader SME sector without focusing only on Anglo American's supply chain," says Hlonela. "This is why we're increasingly funding non-mining-related SMEs too."

**A MODEL OF SUCCESS**

Much of Zimele's success is owed to its comprehensive incubator-type approach, which combines funding at preferential cost with hands-on, practical support for entrepreneurs. This strategy, over a pre-determined period, allows the investee company to stand on its own feet, ensuring both long-term

"There's growing recognition that enterprise development enables companies to uplift people through sustainable social and economic development."

- HLONELA LUPUWANA, MD: ZIMELE

government bodies, to deliver on specific mandates.

The six funds include the Supply Chain Fund, the Anglo American sefa Mining Fund, the Community Fund, the Green Fund, the Sebenza (Jobs) Fund and the Godisa Supplier Development Fund. The Funds operate on a commercial basis, albeit with the social purpose of creating sustainable and economically viable enterprises by providing equity/loan funding, mentoring and access to value-enhancing opportunities.

"Each fund has a specific mandate and as new needs have emerged, we've launched new Funds, the latest being the Godisa Supplier Development Fund," says Hlonela.

The inaugural Supply Chain Fund still helps Anglo American's procurement departments to identify appropriate black-empowered SMEs and provides supports by linking them with the appropriate opportunities within the Group. The Fund provides equity and loan finance of up to R5 million per project. It also supplies hands-on support, business guidance and skills transfer.

"The next step was expanding our support beyond our supply chain to businesses operating in the mining sector," says Hlonela. "We then launched the Anglo American sefa Mining Fund in 2003 to address this."

A joint initiative between Anglo American and sefa, formerly known as Khula Enterprise Finance Ltd, a government-owned entity that promotes small and medium enterprise development,

04 Mma le Duma grass cutting services. 05 Dr Lorna Maphuthuma with Rose Kgoete, Zimele hub manager in Burgersfort. Lorna is a medical practitioner who runs a large practice which was provided with seed capital from the Zimele Small Business Fund.

commercial viability and sustainable growth. It's one of the reasons Anglo American has rolled out similar programmes in other countries where it operates.

"We make sure we're involved not only in the support of the business, but also in providing the necessary support for individual owners and employees," explains Hlonela.

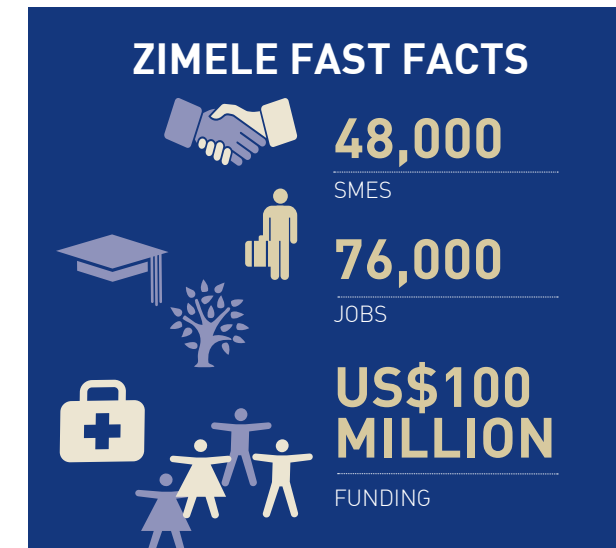
The Zimele model of combining financial support with mentorship has been adopted by a number of local and global players. These include the World Bank, the United Nations Development Programme, the International Finance Corporation (IFC), Mondi and Barloworld. The IFC has used the model as the prescribed best-practice approach for companies around the world seeking to integrate local SMEs into their supply chains.

"There's growing recognition that enterprise development enables companies, especially in the mining industries where there's a limited period of development and operation, to uplift people through sustainable social and economic development," says Hlonela. "Enterprise development is really about creating independence through entrepreneurship."

She says it's rewarding to see entrepreneurs becoming leaders in their communities and inspiring others to start their own businesses. "We make support available to leaders who already have the potential to innovate, deliver and grow; they're just able to deliver on this potential quicker."

**DEVELOPMENT PARTNER**

In South Africa, Zimele has now grown to six funds. These focus on developing different types of businesses in particular sectors. The organisation partners with other role-players, including development institutions and



“We make support available to leaders who already have the potential to innovate, deliver and grow; they’re just able to deliver on this potential more quickly.”

– HLONELA LUPUWANA, MANAGING DIRECTOR: ZIMELE

the Fund focuses on promoting mining-related investments.

“The barriers typically faced by aspirant miners include prospecting permits, lack of access to development capital and a shortage of sound advisors and guidance appropriate to the needs of emerging mining companies,” says Hlonela. “So the Fund was set up to help emerging black-owned mining operations with commercially viable prospects.”

In the next phase of growth, the Community Fund was introduced in 2007 to assist entrepreneurs in Anglo American’s business unit areas, current and previous labour-sending areas and pre-defined poverty nodes. The Community Fund provides black entrepreneurs with seed and working capital through loan finance of up to R2 million per project at preferential interest rates.

Zimele introduced the concept of business hubs and over the past seven years it’s created 22 community-based centres for business development across South Africa.

“This is where on the ground, entrepreneurs can get access to business advice, as well as administration support,” says Hlonela.

As environmental issues and green energy began to take



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centre stage, with concerns about global warming becoming increasingly important, the Zimele Green Fund was launched to target investment opportunities that mitigate greenhouse gas emissions, reduce energy and water consumption, and improve waste and emission management. The Fund’s current portfolio includes businesses which involve waste recycling, the manufacture and sale of organic fertiliser by disabled workers and the facilitation of subsistence vegetable cultivation among impoverished communities.

In South Africa, one of the biggest challenges remains



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unemployment. With more than 4.5 million unemployed people in the country, according to Stats SA, Zimele wanted to do more to address this issue. The Sebenza Fund, a partnership with the Development Bank of South Africa, mirrors what’s been achieved with the Community Fund. It increased the size of the network to nearly 50 hubs. These provide access to affordable finance, ongoing business support, structure and mentorship programmes to entrepreneurs, both start-ups and existing businesses throughout the country, including labour-sending areas.

“In this initiative we’re partnering with government to bring our enterprise development model to areas where we source our labour,” says Hlonela. “In this way, we’re not only supporting SMEs within and outside our supply chains, but also outside our mining operations.”

Focusing only on poverty alleviation and the creation of meaningful and sustainable employment in poverty nodes and high unemployment areas throughout South Africa, the Sebenza Fund aims to create 8,000 new jobs by March 2016.

The latest Fund to be launched under the Zimele umbrella is the Godisa Supplier Development Fund, a tripartite agreement between Transnet (South Africa’s national transport authority), sefa and Anglo American.

The focus of this new Fund is the development of black-owned SMEs, primarily in Transnet’s procurement value chain, with a focus on the company’s rail and port businesses. Each partner in the Fund will contribute R55 million towards it, totalling R165 million.

**GOING GLOBAL**

Building on the success of Zimele in South Africa, Anglo American took the Zimele concept to Chile in 2006. Called “Emerge”, the programme also provides access to capital, but focuses on business advice and mentoring with a three-tier approach that matches different levels of entrepreneurs’ maturity and allows them to graduate from one level to the next.

**CASE STUDY**

**GROWING ENTERPRISE**

When 28-year-old former Paralympian Sarisa Ferreira’s family was about to lose their farm in the Eastern Cape due to drought and floods, she decided to start a business to save it. This was the beginning of Areli Veg, a small business that plants vegetables and citrus fruits, packages the produce and distributes it to retailers.

Over time, Sarisa was able to build her business to the point where it was producing a turnover of R4 million a year, with six employees. But in order to grow, more funding was needed.

“When we got in touch with Zimele, we’d only been in business for one year,” she says. “With the kinds of orders we were receiving, the small factory we had simply couldn’t deliver to our growing market. We needed to expand, get more equipment and more space.”

Zimele gave Areli Veg the loan it needed to buy more equipment and employ more staff to meet the demands of the market.

“Without Zimele, my business wouldn’t be where it is today,” says Sarisa. “We accomplished in one year what we’d only have been able to do in 10 years without it.”

Areli Veg now turns over R4.5 million per year, with a staff complement of 87, providing fresh-from-the-farm packaged vegetables and citrus fruit to major retailers such as Pick n Pay. Moreover, the business is situated in Patensie in the Eastern Cape, creating much-needed jobs in an area with high levels of unemployment.

“In the next 10 years, I want to see the business become debt-free. I’d also like to expand by building a cutting-up and vegetable processing facility,” says Sarisa. “This will help us push production to full capacity and enter exciting new markets.”



Anglo American launched enterprise development programmes in Botswana and Brazil last year and, earlier this year, another in Peru.

“The model of enterprise development under Zimele has grown from a local concept into a global phenomenon and we’re looking at expanding it in every territory we operate in,” says Hlonela. “Recognising the fundamental role of enterprise development in the success of our own business, our leadership endorses a global framework that can be tailored to different countries.

“We’re consistently coming up with new ideas to fund businesses in a range of different industries,” says Hlonela. “The key thing is that we aim to be a development partner by choice. It’s only through working together that the public and private sectors can tackle issues such as economic growth and poverty alleviation to create a context where businesses can grow, jobs can be created and entrepreneurs given support to become masters of their fate and captains of their souls.”

**CASE STUDY**

**POWERING ON**

Having worked for Anglo American Platinum for seven years, Andrew Aphane decided to venture into business and was looking for an opportunity where he could create jobs and add value. With help from Zimele, Andrew is now a shareholder and director at Data Electrical Instrumentation (DEI) Projects – an electrical and instrumentation company that supplies low-voltage and medium electrical systems.

The company employs 190 people and in 2013 had an annual turnover of R41 million. Wherever it runs projects, DEI Projects draws 80% of its workers from the local community. The company has also opened offices in Mogalakwena, Rustenburg, Johannesburg and Amandelbult.

The company has expanded over the past few years and has full capabilities for the design, manufacture, supply and installation of electrical instrumentation and control systems for all industries. DEI Projects specialises in the manufacture of electrical panels from simple low-voltage distribution panel to sophisticated Process Control Integration, as well as comprehensive installation and construction expertise.

As part of giving back to society, DEI Projects supports an orphanage in Thabazimbi and a children’s soccer team based at Cosmo City.



07 Rebeca Briones with her father at the El Pino Ornamental and Medicinal Plant Concern Nursery, Ocoa V Región, Chile. The nursery is part of the Emerge Entrepreneurs Programme.  
08 Mokopi Construction is a building company based at the Amandelbult concentrator. It’s owned and managed by Joshua Pheyaga.



# MINING LEKGOTLA 2014

A collaboration between participants in the mining sector, including government and labour, the event was initiated in 2012 to provide a way for key players to engage publicly on key issues affecting the industry. This year, the third annual Mining Lekgotla once again proved to be a platform for rigorous strategic conversation among stakeholders in the mining industry.

The theme of the conference was "Building on the Contribution of Mining Since the Advent of Democracy: The Past We Acknowledge and the Future We Build Together". "It was a chance for role-players to look back on the challenges faced by the mining sector over the past year, celebrate successes and plan a way forward for mining in SA," said Khanyisile Kweyama, convenor of the Lekgotla and executive director at Anglo American.

She added that the mining industry found itself at a crossroads: on the one hand, it needed to address challenges around labour relations, operational competitiveness, a volatile

market and an increasingly divided national sentiment. On the other, it needed to continue growing the industry, driving meaningful community and infrastructure investments, and developing partnerships and sustainable stakeholder relations.

"These aren't issues that can be fixed overnight. It also shouldn't be any one entity's responsibility to find solutions to these complex challenges," said Khanyisile.

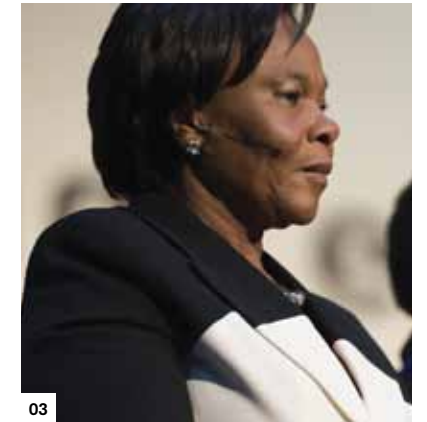
Successfully addressing these challenges would require identifying and dealing with the issues head-on. All relevant parties would need to understand their intricate nature, background and foreground, and ensure that the potential



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solutions were in line with global best practice.

"It's our democratically ordained responsibility to continue to contribute to our country's next 20 years of development, growth and prosperity," she added.

On the agenda this year was the role of mining in the National Development Plan (NDP), government's blueprint for economic growth and development. It was also an opportunity to draw lessons from the five-month strike in the platinum industry and discuss ways to improve relationships between mining companies and their employees.

Jeff Radebe, Minister in the Presidency Responsible for Planning, Monitoring & Evaluation, said the role of mining had been clearly defined in this national plan.

"The NDP envisages a vibrant economy which still has a mining sector playing a crucial role," he said. This includes exports and foreign direct investment, production of commodities for energy and manufacturing, beneficiation and procurement.

Minister Radebe said the role of mining in the economy of SA had changed over the past 60 years from being perhaps the biggest employer, contributing 21% to the country's GDP in 1970, to 8-9% today. Employment trends had also dropped from 800,000 workers in the early Nineties to about 500,000 workers today.

"However, this doesn't deviate from the critical role this sector plays in our economy," he emphasised. "It has many linkages with the rest of the economy, including manufacturing, transport,

financial services and energy, among others."

Estimates of total GDP contribution – including indirect and multiplier impacts, as well as sectors that rely on mining activities – ranged from 15-18%. It also remained a critical source of investment. As a proportion of total gross fixed capital formation, mining's share was at 12% in 2012. Mining commodities accounted for 46% of exports in the fourth quarter of 2013, while downstream mineral-related manufacturing exports accounted for another 14%.

"Needless to say, the mining industry is closely linked to the history and economic development of our country," added Minister Radebe. "The sustainability of this industry and its continued contribution to our economic development should, of necessity, be of interest to all South Africans."

Minister of Mineral Resources Ngoako Ramatlhodi said: "We have a collective duty and responsibility to recognise our ugly past and shape our common future. To do this, we must engage candidly about the state of mining in SA."

Khanyisile emphasised that the past two years had been the industry's toughest ones, from a reputation and credibility perspective. The mining industry had further recognised the challenges it faced and the legacies it had inherited, which had not been adequately addressed.

High-profile speakers included African Union Commission chairperson Dr Nkosazana Dlamini-Zuma, who delivered the keynote address on Africa's mining vision. "Whether you're in

01 Khanyisile Kweyama, executive director of Anglo American South Africa. 02 Minister of Mineral Resources Ngoako Ramatlhodi 03 Minister of Women in the Presidency Susan Shabangu at the 2014 Mining Lekgotla. 04 Khanyisile Kweyama presents a gift to Dr Nkosazana Dlamini-Zuma, chairperson of the African Union Commission with Minister Ramatlhodi.



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“Sometimes we forget the role mining has played in terms of infrastructure development. Johannesburg is a case in point. If we get this right in Africa, we can create many ‘Johannesburgs’.”

– THEMBA MKHWANAZI, CEO: ANGLO AMERICAN COAL SOUTH AFRICA

mining or not, the one billion African people are our most precious resource,” she said. “Investing in their health, education and basic needs should be critical to government and the private sector.”

A panel discussion that centred on infrastructure for industrialisation was chaired by secretary-general of the National Union of Mineworkers, Frans Baleni. During his address, Themba Mkhwanazi, CEO of Anglo American’s coal business in South Africa, added: “Sometimes we forget the role mining has played in terms of infrastructure development. Johannesburg is a case in point. If we get this right in Africa, we can create many ‘Johannesburgs’.”

The employment of women in mining remained a concern, said Khanyisile. “It’s lonely for me up here, as you can see. It’s lonely, too, for the small minority of women employed in mining operations.”

Dr Dlamini-Zuma spoke of a disproportionately high number of men in the mining sector and the need to change this. “If you give financial strength to women, you’re strengthening the family, the community and the nation,” she said.

Minister of Women’s Affairs, Susan Shabangu, also addressed the forum, saying that although the level of women

in mining had increased from 1% to around 10%, more needed to be done to get women into programmes that prepared them for mine work and managing mining companies.

Minister Ramathodi committed to rigorous and transparent engagement with stakeholders on the Mineral & Petroleum Resources Development Amendment Bill.

Vusi Mabena, senior executive of the Chamber of Mines of SA, made the concluding remarks, noting that transformation remained a challenge. “It’s clear that the gears of transformation are turning too slowly. What must also be highlighted is that we know there needs to be a clear tracking mechanism on the outcomes of these Lekgotlas,” he said.

Minister Radebe reiterated that the unresolved tensions between the role-players in the industry would need consideration. Trust-building, constructive negotiations and arriving at amicable solutions were a good recipe for the avoidance of protracted industrial action, he added.

“All these should take into account the interests of workers, companies, communities and the economy,” said Minister Radebe. “Differences of opinions and views, driven by the needs and the interests of the constituencies we serve, are part and parcel of a democratic society. We believe that engagement, rather than avoidance, mutual respect for one another’s views and the interest of our country’s economy will be of benefit to all South Africans.”

Khanyisile said the Lekgotla provided an opportunity for all stakeholders to be heard and contribute their views. “We commit to ensuring that the views expressed at this Mining Lekgotla are channelled to appropriate industry structures such as the Mining Industry Growth and Development Task Team,” she said. “Through this, the industry will continue to engage on matters raised here and provide feedback, where possible, at the next Lekgotla.”

# OPTIMISING THE MINE PLAN AT SISHEN

The 61-year-old Sishen iron ore mine is undergoing a makeover to ramp up production.

An improved mining plan and complete redesign of operations at Anglo American’s Sishen iron ore mine are expected to extend the mine’s life by another 20 years. Comprehensive technical studies concluded last year confirmed that Sishen would produce, on average, 37 million tonnes per annum for the remainder of its life.

Plans are afoot to ramp up production to this level by 2016. This involves removing 600 million tonnes of waste from Sishen’s life-of-mine plan and introducing ways to work smarter. The new mine plan targets a faster increase in iron ore produced in relation to waste mined, so that by 2016 Sishen will be mining 37 million tonnes of ore with 270 million tonnes of waste. That is the level at which waste will peak and it will remain there for three to four years, then reduce.

Sishen mine is 14km in length, one of the biggest open-pit mines in the world. So far it has produced more than 900 million tonnes (Mt) of iron ore, and still has 864.1 Mt of proven and probable reserves.

However, Sishen’s ore body dips in a westerly direction at 11 degrees. The old mining direction was from south to north, covering the full 14km strike length. Now, to more efficiently access ore, the mining direction has been switched by 90 degrees, from east to west, which means more waste has to be extracted.

The new plan for Sishen has several elements, the first step being to optimise the mine plan with a new understanding of the resource. Production will be maximised through the optimal design of the pit, so that mining is sequenced to get the best ore exposure and enable greater efficiencies.

Early steps of the plan, in which Sishen is already well advanced, include moving a railway line and associated infrastructure and relocating about 300 households from Dingleton to Kathu, both of which will enable the mine to be expanded to the west.

A core focus area is to improve productivity at the mine. Sishen is implementing the first Business Process Framework in the

Anglo American Group – focusing on productivity improvements through improved work management at the internal waste mining operations. Later, this will be extended to the pre-stripping operations. The set-up, which commenced late last year, has now been completed. The framework is expected not only to improve productivity, but also to enable operations to maintain a steady production rate.

An important element of the Sishen Western expansion to ramp up production by 2016 is relocation of the Dingleton community to Kathu. The board has approved around \$400 million over four to six years to relocate Dingleton and the first households are expected to move by the end of this year.

**An important element of the Sishen Western expansion to ramp up production by 2016 is relocation of the Dingleton community to Kathu.**

The construction of houses has commenced. Schools, churches and businesses will also be built. Anglo American continues to engage extensively and sensitively with the community.

Two new waste dumps will be constructed which should result in shorter hauling distances and better utilisation of equipment.

This year also completes an initial five-year fleet acquisition plan. The fleet plan for the next five years will take the mine to its peak in waste mining.

While this is a full plate of work for Sishen, full of challenges, Anglo American is confident that Sishen is on course to meet the 35-million tonne production target for the year; 36 million tonnes in 2015; and 37 million tonnes in 2016. Although these are tough targets, the technical work conducted and execution of the mining plan so far indicate that these targets are achievable.

Based on detailed technical and geological work, the new mine plan provides the optimal way to return Sishen to delivering its full potential.

05 Virginia Tyobeka, head of human resources at Kumba Iron Ore, speaking at the event on women in mining.  
06 Themba Mkhwanazi, chief executive of Anglo American Coal: South Africa.

# TRACING THE BEGINNING OF AN INDUSTRY

Jade Davenport's book, *Digging Deep: A History of Mining in South Africa* (Jonathan Ball), offers a complete history of South Africa's phenomenal mineral revolution spanning more than 150 years. Here she traces her way back to the cradle of South African mining and the catalyst of the mineral revolution: the discovery of diamonds in the late 1860s.

Beneath the surface of South Africa's incredibly varied landscape lies the richest mineral treasure trove ever to have been discovered in a single, confined region. Almost every precious stone, metal and mineral known to man has been found here in deposits varying from mere traces to quantities of unparalleled value. The history of the exploitation of that treasure trove is as rich, diverse and extensive as the mineral resources themselves.

Southern Africa, in fact, boasts the longest mining history in the world with the site of the oldest known mining operation, Lion Cavern, situated on a high ridge of the Ngwenya Mountain in Swaziland, dating back to 41 250 BCE. It was an archaeological programme funded by Anglo American in the 1960s that uncovered the site and revealed that late Stone Age populations had quarried Lion Cavern's rich haematite deposits as a source of red ochre. This was used for cosmetic and ritualistic purposes.

Although the frequency and extent of mining activities in the wake of that fledgling operation are barely understood, it's certain that indigenous populations, particularly metal-working clans, were exploiting metalliferous deposits, most noticeably in the area that today constitutes the Limpopo province, from the fifth century CE onwards. Mining activities

tended to concentrate on iron ore, tin and copper, owing to their usefulness in the manufacture of tools, weapons and decorative objects. Unfortunately, because most of the ancient and pre-colonial mines were viewed simply as indications of the existence of rich metalliferous deposits, much of the archaeological evidence that could have shed light on that era of South Africa's mining history was destroyed by colonial and post-colonial prospecting and mining activities.

When the Cape of Good Hope was occupied by the Dutch East India Company in 1652, the colonists gave little thought to the mineral potential of the new land, their only priority being the production of food and the maintenance of the vital port between Europe and the East. Such was the general lack of mining ambition, coupled with the lack of incentive to pioneer such an industry, that it was only 200 years after the arrival of white settlers that a truly commercial mining sector was finally established. South Africa's first commercial mining sector concentrated on the exploitation of the rich copper deposits of Namaqualand – a resource that had been well known since the days of Governor Simon van der Stel – with the first mine commencing operations on the farm Springbokfontein in 1852. Despite initial logistical and legislative teething problems, as well as a disastrous copper

01 Mining head gear, a common sight on the Witwatersrand for many years.



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02 The Red Cap Party – a group of fortune-hunters in South Africa, led by Fleetwood Rawstorne and credited with discovering the Kimberley diamond deposits, circa 1871. Damon, the camp's cook, who found the first stones is on the left. 03 The early days of the Kimberley mine in 1871. The image shows one of the first mining machines, a rotary washing pan. 04 The Eureka Diamond which spurred the South African diamond rush was found on the banks of the Vaal River by a child. 05 Pilgrim's Rest in the late 1870s. 06 The Golden Quarry was so named because it looked as if the entire rock was made of gold. 07 The main reef workings on the Witwatersrand gold mining company's claim. 08 A Witwatersrand gold mine. 09 Men prospecting for gold in a trench on the Rand.

share bubble, the Namaqualand copper mining industry grew steadily and continued well into the late 20<sup>th</sup> century. While Namaqualand can be considered the cradle of South African mining, the real catalyst of the mineral revolution, on the back of which the country's modern industrial economy has been built, was the discovery of diamonds in what is today the Northern Cape in the late 1860s.

The discovery of the 21.25ct Eureka Diamond in 1866 and then the 83.5ca (which was cut down to a 47.69 carat gem) Star of South Africa in 1869 sparked the country's first great mineral rush, with thousands of locals and foreigners rushing to the dusty hinterland to seek their fortune first at the Vaal River and then in Kimberley's four great kimberlite pits. Such was the magnitude of the rush that the diamond mining industry had to be established on the principles of "Diggers' Democracy", which enabled every man to own and operate (with the most primitive of tools) at least one, but no more than two claims of 30 square feet.

However, that independent, small-scale mode of working claims became increasingly impractical as operations grew more costly and dangerous the further into the bowels of the earth diggers excavated.

Thus, from 1874 onwards, not only did the operations have to embark on a technological revolution so that the diamondiferous material could be effectively hauled out from the ever-deepening pits, but a process of consolidating the various individual claims needed to be undertaken to make operations more viable and cost-efficient. The consolidation of the diamond workings was largely dominated by Cecil John Rhodes and Barney Barnato, who established South Africa's most enduring mining enterprise, De Beers Consolidated Mining, and achieved the complete monopolisation of Kimberley's diamond mining industry in 1888. The diamond monopoly established by Rhodes was further entrenched and made exceedingly powerful under the auspices of Sir Ernest Oppenheimer and his family during the 20<sup>th</sup> century.

While the history of gold mining is often presumed to post-date that of diamonds, the precious metal was discovered, and the first mine established, at roughly the same time as the diamond rush. In the closing months of 1870, a seemingly payable gold deposit was found on the appropriately named farm Eersteling in the north-eastern region of the Afrikaner Republic of the Transvaal. Although the mine soon proved disappointing, news of the discovery ignited gold fever in the Republic and hordes of men, particularly unlucky diamond diggers, flocked to the Eastern Transvaal in search of their fortunes. Their fossicking activities soon led to a number of significant discoveries and rushes, most notably the Pilgrim's Rest gold rush of late 1873 and the Barberton gold rush of 1885. It was at Barberton that the world's single richest occurrence of gold – Bray's Golden Quarry, which yielded 50,000 ounces of gold from 13,000 tons of ore – was discovered and produced one of South Africa's most frenzied share bubbles. However, the significance of the

**“Beneath the surface of South Africa's incredibly varied landscape lies the richest mineral treasure trove ever to have been discovered in a single, confined region. Almost every precious stone, metal and mineral known to man has been found here in deposits varying from mere traces to quantities of unparalleled value.”**

Eastern Transvaal gold rushes pales in comparison with the Witwatersrand Basin, which – while low-grade – is by far the largest gold resource ever discovered. One-third of the world's entire gold stock has been sourced from it.

“While it’s true that the success of South Africa’s modern economy was underpinned by the phenomenal growth of the gold and diamond mining sectors, the industrialisation of the economy couldn’t have been achieved without coal and iron ore.”


By the time gold was discovered on the farm Langlaagte in February 1886, the domination of organised capital and the rule of the powerful mining magnates had become the *status quo* of Kimberley’s diamond industry. Coupled with this was the fact that, from the start, the Witwatersrand goldfield proved no poor man’s diggings: the geological nature of the gold-bearing conglomerates, as well as the very low grade of that resource, meant that miners would require vast sums of capital, labour and expertise to viably exploit the precious metal. For these reasons, the Witwatersrand gold mining sector was pioneered by ready-made mining magnates – men such as Joseph B Robinson, Alfred Beit, Rhodes and Barnato – and was rapidly dominated by a handful of powerful mining finance houses that controlled large numbers of extensive gold mines.

The Witwatersrand gold mining industry developed at an unparalleled rate, despite numerous challenges, ranging from the considerable depth and pyretic nature of the conglomerate reefs to the high costs of production and the enormous labour requirements of the mines. By the end of the 19<sup>th</sup> century, a plethora of large-scale mines, extending along a Golden Arc from Benoni in the east to Randfontein in the west, were collectively contributing one-third of the world’s entire annual gold production. The growth of the sector continued largely unabated for much of the 20<sup>th</sup> century, supplemented by the discoveries of the Evander, the Far East Rand, the West Wits Line, Klerksdorp and the Orange Free State Goldfields. Gold output from the Witwatersrand’s 53 operating mines peaked at a phenomenal 1,147 tons of gold in 1970. However, from the 1970s the gold sector began to slip into decline, largely spurred

by a range of international financial, oil and military crises. While it’s true that the success of South Africa’s modern economy was underpinned by the phenomenal growth of the gold and diamond mining sectors, the industrialisation of the economy couldn’t have been achieved without coal and iron ore. It was the vast resources of coal – first discovered in the 1850s, but developed on a significantly large scale as the needs of the mining industry began to expand from the 1890s onwards – that provided the entire power base of the country. From the turn of the 20<sup>th</sup> century, a network of coal-fired power stations that largely utilised the extensive coal deposits of the Witbank-Middelburg coalfield dominated South Africa’s energy sector. Similarly, the capitalisation of the country’s vast iron-ore resources in the North West and Northern Cape provinces, as well as the establishment of a state-controlled iron and steel industry in the 1920s, facilitated the growth of a secondary industry and enabled South Africa to develop into the most industrially self-sufficient country in Africa.

Platinum, the precious metal that now constitutes South Africa’s flagship mining sector, was discovered by one of the world’s pre-eminent geologists, Hans Merensky, in 1924. However, from a historical perspective, the platinum group metals have certainly been the most erratic of all South Africa’s mining sectors, being subjected to a far greater degree to the exceptionally sensitive whims of supply and demand. For the first 30 years the market proved so challenging that only one company, Rustenburg Platinum Mines, was able to operate successfully. It was only in the early 1970s, with exceptional growth in demand for platinum catalytic converters, that South Africa’s platinum sector began to experience significant growth and company diversification.

In the latter half of the 20<sup>th</sup> century, the mining industry underwent considerable diversification with the growth of new sectors such as uranium, chromium, vanadium and manganese. Although the industry is currently facing many challenges, after more than 150 years of commercial enterprise, South Africa still has one of the most diverse and important mining industries in the world, as well as an attractive resource base that holds much promise for future mining activities.



**ABOUT THE AUTHOR**  
Jade Davenport is a historian, journalist and columnist based in Johannesburg. She studied at the University of Cape Town and holds a MA (*cum laude*) in historical studies. Her dissertation was entitled: *An Examination of the Evolution of Mineral Legislation of the Cape Colony: 1853-1910*. She has worked for *Mining Weekly* magazine and online publications for the past nine years.



**WIN** Three lucky readers can each win a copy of Jade Davenport’s book *Digging Deep*. To enter, please email the Editor at [mooketsi.mocumi@angloamerican.com](mailto:mooketsi.mocumi@angloamerican.com) with your full contact details and the answer to the following question: **What year was the Eureka Diamond discovered?** Please see terms and conditions on page 5.



# HOME-GROWN TALENT

From bursar to director, Nompumelo “Mpumi” Zikalala joins the Board of De Beers Consolidated Mines.

When Mpumi was appointed to the Board of De Beers, it was a reflection that the organisation’s programme of nurturing its young talent had paid off.

She joined De Beers in 1996 as a bursar and, over the years, grew to fill a number of senior roles in it, in both mining and diamond trading. In 2007 she was appointed general manager of Kimberley Mines, becoming the first female general manager of a major diamond mine. She held the same position at Voorspoed Mine from 2010.

In May 2013, Mpumi was appointed senior vice-president of De Beers Sightholder Sales SA, the rough diamond trading division.

“I’m delighted at Mpumi’s appointment to the Board,” says Barend Petersen, chairman of De Beers Consolidated Mines. “Her appointment is proof that De Beers identifies and nurtures home-grown talent, creating opportunities for talented leaders at the most senior levels of the business.”

He adds that she’ll bring a wealth of experience in mining, diamond trading and in advancing the economic and social transformation of the South African company.

“Mpumi’s extensive diamond experience, together with the insight she’s gained in her non-executive capacity at Mintek, will create value for both De Beers and its partners,” says Barend.

## PLAYING OUR PART IN LEADING THE WAY FOR #WOMANINMINING



**DE BEERS**  
28% of De Beers’ workforce are women: 20% are senior management, 26% are middle management and 27% are junior management.

**ANGLO AMERICAN’S EMEA SHARED SERVICES IN SA (AAESS)**  
73% of AAESS’s workforce are women: 69% are senior management, 61% are middle management and 68% are junior management.

**KUMBA IRON ORE**  
18% of Kumba’s workforce are women: 13% are in core mining positions and 20% are in management.

**ANGLO AMERICAN PLATINUM**  
13% of Anglo American Platinum’s workforce are women: 20% are in management and 11% are in core mining positions.

**COAL SA**  
19% of Coal SA’s workforce are women: 11% are senior management, 25% are middle management and 19% are junior management.

**ANGLO AMERICAN’S CORPORATE DIVISION (ACD)**  
43% of ACD’s workforce are women: 39% are senior management, 47% are middle management and 51% are junior management.

# FOSTERING SAFETY, OWNERSHIP & ACCOUNTABILITY

Themba Mkhwanazi took up the reins as CEO of Anglo American Coal in South Africa earlier this year. He outlines his leadership style and plans.

A chemical engineer by background, Themba's career spans more than 20 years across business, operational, engineering and management roles within the resources industry, associated with a number of minerals, commodities and countries. Most recently he was based in the USA as Rio Tinto's Regional General Manager for the Americas, where he was responsible for delivering technical and operational improvements across Rio Tinto's businesses in the region.

Themba has extensive international operating experience gained across his two decades in the resources industry, including 16 years in South Africa. His leadership and technical expertise will be instrumental in helping Anglo American's Coal business in this country deliver its full potential.

His appointment follows Godfrey Gomwe's decision to retire from Anglo American after a 15-year career with the Group.

"I'm looking forward to building on the unique heritage, great work ethic and reputation that have been distinguishing features of this business under Godfrey," says Themba. "I'm also totally committed to tackling the many challenges that currently face our business."

He and his team have defined key business objectives and projects and, in line with Anglo American's Driving Value programme, have identified four critical focus areas: commercial and operational performance, portfolio restructuring, as well as cost reduction to deliver improved business performance. He notes the importance of working in partnership to the success of this strategy.

"We need to fully leverage the cumulative experience, expertise and diversity of the Anglo American Group to achieve our targets," he adds.

When it comes to safety, Themba passionately believes Zero Harm is achievable in the working environment.

"[Zero Harm] isn't only a goal, but a fundamental value to me. It's very much a non-negotiable reflection of my leadership and the climate I'm personally committed to creating."

He adds that when it comes to stakeholder engagement with customers and shareholders, government, trade unions and communities, staying ahead is important.

**"[Zero Harm] isn't only a goal, but a fundamental value to me. It's very much a non-negotiable reflection of my leadership and the climate I'm personally committed to creating."**

— THEMBA MKHWANAZI, CEO: COAL SOUTH AFRICA

Themba maintains that a business which holds real promise of long-term prospects delivers on the following: superior margins and returns through the cycle driven by sustainable competitive advantages, with little or no debt. An essential component of success here is that the business is also led by a first-class management team who think like owners.

"We all need to think with an owner's attitude, taking personal responsibility for the overall business performance.

"Such a business ensures that all its employees share in a real feeling of ownership. The business that has promise is led by winning teams, is recognised and trusted by its stakeholders as the mining company of choice and is recognised for its consistency in creating and delivering sustainable, real value that makes a difference," he says.

# EXPERT OPINION: ENTREPRENEURSHIP

Pavlo Phitidis, CEO of Aurik Business Accelerator and a director of Aurik Enterprise Development, gives his view on changing “needs” into entrepreneurial opportunities.

Stakeholders in the South African economy often speak to the needs of the country and the responsibility of entrepreneurs. Apparently, entrepreneurs are the hope of future job creation. Intellectually, this makes sense and the establishment of a vibrant SME sector remains South Africa's greatest hope of creating a stable environment.

To achieve this, we must all think like entrepreneurs. This includes recognising the role of businesses, government and trends that go beyond needs, into opportunity. Entrepreneurs don't respond to needs: they respond to opportunity, and creating opportunity from expressed needs is the mark of an entrepreneurial mindset.

For an entrepreneur to craft opportunities, an evaluation of the business environment should include role-players and trends. Here are a few thoughts that set this scene.

## BIG AND SMALL BUSINESS

Big business has a vital role to play in any economy. The nature of its size means that the most effective management tool is that of systems, policies and procedures which guide the behaviour of staff and the business itself. Standardising these activities ensures that the probability of consistency is high, an important feature of brand and risk management. This, combined with marketing muscle, enables big businesses to service the nation across our land. The shadow implicit in these capabilities is found in the rigidity and slow action inherent in a business governed by strict procedures and compliance regimes.

The nature of the business environment today is that change is taking place at a faster pace than before. Uncertainty is the new certainty and markets are changing rapidly.

Small businesses are agile in nature. They have the ability to create economy out of small markets, can adapt quickly to opportunities and can innovate on the go. Their shadow lies in their ability to scale and reach the corners of our nation with the goods and services they create.

Given these attributes, there's a natural synergy that can be exploited by entrepreneurs in both big and small businesses.

## TRENDS

The nature of the business environment today is that change is taking place at a faster pace than before. Uncertainty is the new certainty and markets are changing rapidly. Dynamics driving this environment emerge from a number of trends.

## Government policy

In order to create a more inclusive economy, government – in agreement with business – created the BEE codes. Within the mining sector, the policy agreements went further to include the Social Labour Plans that earn mines the social licence and right to mine.

The area of particular interest to me is that of enterprise and supplier development. Recently I attended the World Procurement Leaders' Congress in London. I listened to the procurement heads of the world's biggest companies speaking about best practice. In a nutshell, it was reduced to a principle of “less is more”. Work with fewer bigger suppliers who have balance sheets that you can sue against for breaches of service-level agreements. It makes for a simpler and more agile business.

My contribution to the debate wasn't well received in this developed economy conference, which was predominantly North American- and European-represented. Governments in emerging economies are increasingly asking how they can leverage their natural resources to fulfil their developmental agendas. Whether it's looking to the private sector to support healthcare by building clinics, contribute to skills development, support SME development, build houses or undertake infrastructural projects, governments are looking beyond the

tax revenues that big business generates. They want businesses to become active stakeholders in developing more sustainable economies. In exchange, they open the doors of opportunity for profit. This applies to minerals, sunshine, wind, water and an under-served consumer economy.

## Business models

Since 2008, some interesting research has been conducted on how to survive and thrive in the global credit crisis. The most compelling piece of research came out of a study done over two years following the world's biggest brands in six sectors of the global economy, including mining. The top-performing companies in these sectors shared a single trait: they focused on no more than three strategic imperatives in any single year. Those that beat them focused on two imperatives only. Needless to say, the leading performers focused on a single strategic imperative. They've become obsessed with leading and occupying a niche in a multi-national environment. The ability of a business to distinguish between core and strategic, non-core but strategic, and non-core and non-strategic activities informs the capability of the business to build agile models that can adapt to change.

## Technology

Cloud-based services have brought the long-promised business model muscle so long enjoyed by big business to the SME sector. Since 1998, the concept of an active server page serving big business benefits to small businesses at small business prices has suffered many false starts. Today, this is a reality and its momentum is building. Small businesses in well-developed markets (good, reliable, cheap bandwidth) can build and scale at a tremendous pace. In the USA, small business start-ups are keenly observed as potential competitors and acquisitions by larger, less agile big businesses.

## Media

The images presented by media are often underestimated. From the Arab Spring to the looting riots in the UK during 2011, ideas of how to protest or disrupt proceedings of government and business are seeded in civil society. These images are ignited by the growing income inequality gap.

## Civil protest

The idea of protesting and how to do so effectively, borrowing ideas from the media and utilising technology, lend fuel to the communities excluded from economic opportunity. The growing income inequality gap is considered by many to be the single biggest disruptor of successful economic recovery.

## BEING ENTREPRENEURIAL

Being entrepreneurial goes beyond starting and growing your own business. It's an attitude that translates into action through



your head, heart and hands. It's a practical approach to looking beyond the needs of the country bestowed upon us through policy. Within the mining industry, an entrepreneurial mindset is one that recognises the capabilities of big and small businesses, embraces the trends driving the business environment and acknowledges the needs of government. An entrepreneurial mindset then crafts out opportunities within the confluence of these factors.

Effectively engaging the expressed need for enterprise supplier development (ESD) into an opportunity provides big business with its greatest strategic advantage, given the trends driving the economy today. Business working with businesses, leveraging their comparative advantages to their individual benefits, while meeting the needs of government and civil society, generates new opportunities that go beyond the narrow view of what business used to be like in the good old days.

Aurik Business Accelerator works with business owners to grow their businesses into assets of value and Aurik Enterprise Development services big businesses with ESD solutions. Pavlo is the resident commentator on entrepreneurship and business development on Talk Radio 702 and 567 Cape Talk, monthly Growth Guru columnist to *Entrepreneur* magazine and presenter of *The Growth Engines* on *Business Day* TV. He actively consults with business and can be reached at tel: 011 447 5575. Visit: [www.aurik.co.za](http://www.aurik.co.za)



“For Zimele, over the next year, it will be all about driving efficiencies by getting the requisite skills, setting up systematic control processes and defining the targets of what we want to achieve in the longer term. On a practical level, we want to reach out to SMEs and establish additional business hubs in our labour-sending areas.”

– HLONELA LUPUWANA, MD OF ZIMELE: ANGLO AMERICAN

analysts and financial and development experts,” she adds.

Zimele differs from conventional banks in that when considering funding applications, it specifically takes into account developmental factors including the long-term viability of enterprises, as well as their broader economic and community impact. This includes measures such as job creation and local economic development. “Successful SME applicants are able to access finance on developmental lending terms and interest rates. We price for development, as opposed to risk, as long as the enterprise presents a viable business proposition,” she adds.

The amendments to the Broad-based Black Economic Empowerment (BBBEE) Codes require companies to invest 3% of net operating profit after tax in enterprise and supplier development initiatives, with 2% of this focused on enterprises in the supply chain.

Hlonela says with the amended BBBEE codes, enterprise development in the Anglo American context has gone full circle in that there’s a renewed focus on the supply chain.

“If you go back to why Zimele was set up, enterprise development within its supply chain was the overriding goal and mandate of why the organisation exists,” says Hlonela. “In its pursuit of building viable enterprises and sustainable communities today, Anglo American’s most valuable resource remains its supply chain.”

Along with the amended codes and the National Development Plan, Zimele’s strategy will focus on growing the Anglo American sefa Mining Fund, as well as setting up long-term mining beneficiation plans.

Hlonela explains that partnerships are essential. Working with other like-minded companies to ensure Anglo American has a lasting, positive impact utilising its supply chain as the most valuable resource is a priority, not only in the areas where it mines, but also within communities that fall within its labour-sending areas.

# THE PERFECT FIT FOR ZIMELE

Enterprise development in Anglo American’s supply chain is a key focus of Zimele’s new managing director, Hlonela Lupuwana.

For Hlonela, fostering meaningful partnerships that have the ability to address socio-economic issues and thereby support job creation and inclusive economic development is all in a day’s work.

As MD of Zimele, Anglo American’s enterprise development initiative, she’s responsible for leading the team that drives the creation and development of commercially viable and sustainable small and medium enterprises (SMEs).

Hlonela, who is a social sciences graduate and holds an Associate in Management qualification and a Master’s in Business Administration from the University of Cape Town, has more than 15 years of management experience. She acquired

her leadership skills at institutions such as First Rand, Deloitte, the Department of Trade & Industry (DTI) and as CEO of the Small Enterprise Development Agency (SEDA). This experience has enabled her to put Zimele’s strategy into action: promoting collaboration between different organisations and building viable enterprises and sustainable community development.

Prior to joining Anglo American earlier this year, she spent five years (from 2009-2013) as the COO for the enterprise and industry development division at the DTI. This gave her the opportunity to hone her skills in enterprise development, which she also used in her position as non-executive director of the Small Enterprise Finance Agency (SEFA).

It was as CEO of SEDA that Hlonela was able to restore the proper functioning of the institution; develop healthy relationships between the board, management and shareholders; and improve service delivery, as well as its financial and strategic management. This gave her first-hand experience in growing small businesses, making her a perfect fit for Zimele.

“For Zimele, over the next year, it will be all about driving efficiencies by getting the requisite skills, setting up systematic control processes and defining the targets of what we want to achieve in the longer term,” she says. “On a practical level, we want to reach out to SMEs and establish additional business hubs (walk-in centres) in our labour-sending areas, where necessary to support aspiring entrepreneurs.”

Her vision for Zimele is for it to grow into a formidable development financing institution in support of Anglo American goals. “For this, we need the necessary skills in the form of

# LIFE AFTER CLOSURE

The Anglo American Group's Mine Closure Toolbox is now helping other mining companies better manage the end-of-life mine planning process.

Mine closures present mining companies with a host of potential considerations – from a physical, biophysical, economic and social perspective. Up until now, most companies have approached mine closure planning in a fragmented way, dealing with each element separately and exposing themselves to gaps in their closure plans. The Mine Closure Toolbox, developed by Anglo American over the past decade, has recently been released publicly, giving other companies a hands-on guide to the process in a simple, integrated way.

Rudolph Botha, Anglo American's lead on mine closures in its technical and sustainability team, says the toolbox details the necessary steps and considerations to be made when planning for mine closure. The updated toolbox (Version 2, 2013) increases the emphasis on the importance of designing, planning and operating a mine – whether brownfield or greenfield – with closure in mind. It's also important that a preferred future "closure vision" for mines post-closure is developed in consultation with communities and other stakeholders, so the toolbox reinforces the need for improved community relationships and engagement.

Available in English, Spanish and Portuguese, the internationally recognised toolbox assists operations with strategic, long-term mine-closure planning, expanding the focus

One of the biggest benefits of the toolbox is the opportunity for improved community relationships, as the method places emphasis on practitioners consulting with various stakeholders at the right time to the appropriate level of detail.

from merely making financial provision for rehabilitation and physical closure to planning for long-term sustainability. This involves dealing with complex socio-economic, physical and biophysical challenges. It provides a blueprint for everything that must be dealt with when a mine closes, from water management to biodiversity and social considerations.

Officially launched in 2008, the toolbox is now used throughout Anglo American's managed operations and also at some non-managed operations, in partnership with other mining companies.

By approaching the process strategically and integrating it into day-to-day operations and life-of-mine planning, the toolbox allows companies to minimise potential future closure liabilities – in some cases at no additional cost, "spending the same money wisely". Long-term savings are created when mine closure considerations are taken into account – whether in a currently operating mine, in the early stages of operation or even before a mine has opened. At Anglo American, the immediate benefits from the updated toolbox include lower closure liabilities and rehabilitation costs, as well as more effective social and community engagement. At the Venetia Mine, for example, the toolbox was used to reduce end-of-life liability by roughly 30%.

The Anglo American Group has spent an estimated US\$1 million over a five-year period developing the toolbox and recently released it publicly for any mining company to use. This is part of its efforts to share best practices and promote the mining industry as responsible players, leaving positive economic, environmental and social legacies around their mine sites.

Key to the success of the toolbox is ensuring that practitioners at all levels of the organisation – from site to middle management and executives – find it simple, flexible and easy to use. This ensures that various components of mine closure can



*Clockwise from top left:*  
The Oaks diamond mine: rehabilitating the mine from fully operational in 2008 to its condition in 2011.

be practically implemented and teams are able to work together to effectively link the different elements.

Because it's important to follow a structured approach to closure planning, the toolbox guides the planner through three tools in sequence: strategic planning, a rapid assessment of gaps in the planning process and high-level actions for closing them.

One of the first steps in the toolbox is for practitioners to work together in developing a vision for what they aim to achieve after closure. It provides details of each item to be addressed – from the dismantling of machinery to the impact on employees and their dependants – based on the remaining mine life and time to closure.

Because operational changes may be required to ensure faster rehabilitation, the toolbox also promotes cost saving and productivity improvements. Scheduling, resource allocation and budgeting make up the final, detailed planning phase. This encompasses the identification of what technology and

resources are required in order to close any gaps, as well as the implementation schedule and financial planning.

However, one of the biggest benefits of the toolbox is the opportunity for improved community relationships, as the method places emphasis on practitioners consulting with various stakeholders at the right time to the appropriate level of detail. Detailed descriptions and definitions of necessary consultations (in line with SEAT 3) help ensure that site operators and managers are better equipped to interact with stakeholders in the communities around the mine.

In turn, this generates understanding and promotes confidence in the plan, providing an opportunity to develop a lasting positive social legacy. In the final stages, the toolbox guides the company to ultimately relinquishing control of the plan and encouraging the community to take ownership, providing a way for them to be closely involved in decisions affecting their future. This helps create independent communities, long after mines have closed.



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# SERVICE DELIVERY BOOST

Through a strategic partnership, Anglo American is helping municipalities strengthen their capacity to better deliver services to local communities.

To strengthen institutional capacity at municipalities, Anglo American, in partnership with the Development Bank of Southern Africa (DBSA) and the Investment Climate Facility for Africa (ICF), has launched a R120 million support programme at 11 municipalities across five provinces in South Africa.

The primary objective of the programme, which represents an investment for the first three years, is to strengthen institutional capacity in the areas of personnel skills and administrative systems in order to promote long-term municipal sustainability.

"Institutional incapacity and severe skills gaps continue to hinder the prospects of many municipalities across the country," says Khanyisile Kweyama, executive director for Anglo American in South Africa. "As a result, these municipalities struggle to generate enough revenue to maintain basic service delivery to their local communities. When municipal operations don't live up to community expectations, service delivery protests frequently occur, weakening municipal operations and impacting businesses which operate in these areas."

The programme's key deliverables are to develop and implement plans and procedures to improve municipal billing systems and controls, and reduce electricity and water distribution losses at pilot municipal sites.

Revenue enhancement, including data cleansing, billing systems, and water and electricity loss reduction are among the main focus areas of the innovative programme. There will also be comprehensive infrastructure planning and focused operations and maintenance, including replacing water and electricity meters. In addition, the programme will place a strong emphasis on improving internal communications and modifying, reinvigorating and upskilling personnel behaviour.

The programme will also review municipal infrastructure plans, asset management and co-ordination of the sector policies that guide provision of municipal services and provide technical

support to address any shortfalls in the infrastructure necessary for basic service delivery. In addition, the programme seeks to attract inward investment into the 11 municipalities.

"The struggle by municipalities to deliver basic services has increasingly resulted in local communities turning to private companies, development institutions and NGOs to address these challenges," adds Khanyisile. "The private sector is indeed uniquely placed to contribute to a solution, by aligning its efforts with the critical milestones in the National Development Plan [NDP]. And, as a major player in corporate South Africa, Anglo American is committed to identifying programmes and seeking partnerships that focus on alignment with these national strategies."

At the same time, as the largest employer in the South African mining industry, Anglo American is driven by its obligation to the principles of the Mining Charter, particularly when it comes to contributing to the transformation of this strategic industry.

"However, in our efforts to achieve this, we're totally interdependent on the communities that we serve," adds Khanyisile.

Furthermore, since municipal capacity-building is outside the core area of expertise for a mining company such as Anglo American, the company sought a collaborative approach through the partnership with the DBSA and the ICF to develop and implement the support programme. Both these stakeholders share a commitment to aligning with the objectives of the National Development Plan. System strengthening is a key focus of the NDP and the programme will add value to practical interventions that will address the most important needs of local municipalities.

"Through these types of strategic partnerships, our aim is to assist government to create fully functional and sustainable municipalities that are capable of distribution of good-quality

basic services like water, sanitation and electricity infrastructure – cost-effectively and efficiently," explains Khanyisile.

In addition, the programme has been extended to include the Traditional Leadership structures in the Limpopo and the North West. This pilot project will see Anglo American Platinum investing a further R20 million over a five-year period in the Traditional Leadership structures.

## BETTER DELIVERY THROUGH PUBLIC-PRIVATE PARTNERSHIPS

Although provision of municipal services is constitutionally the responsibility of the local authority, Anglo American's efforts to building capacity in communities in and around its mining operations often extends to working in partnership with local authorities, where necessary.

The Municipality Capacity Development Programme was identified as a worthwhile investment, which is aligned to the NDP's focus on developing partnerships with government.

The municipalities being supported are King Sabata Dalindyebo in the Eastern Cape; Ga-Sekgonyana, Gamagara, Joe Morolong and Tsantsabane local municipalities in the Northern Cape; Thabazimbi, Greater Tubatse and Mogalakwena local municipalities in Limpopo; eMalahleni local municipality in Mpumalanga; and the Moses Kotane and Rustenburg local municipalities in North West. This initiative offers benefits for all stakeholders, including Anglo American, allowing us to invest further.

"Reduced pressure on all collaborative organs within our stakeholder universe will free our corporate social investment budgets to focus on activities that leverage our core competencies," says Khanyisile. "A functioning municipality will also support a stable local economic environment, while in turn creating a suitable business climate at municipal level. This will provide a foundation for entrepreneurship and new businesses,

which could help achieve higher levels of local employment and local procurement."

For the municipal capacity-building programme, the ICF, along with Anglo American is providing funding, while the DBSA is the management partner and will provide governance and oversee procurement matters. This includes managing the service providers appointed to implement hands-on skills training at municipal level. The DBSA has highly regarded expertise in building the effectiveness of public institutions, while the ICF is well known for the work it does to improve the climate for investment in Africa by removing barriers to doing business.

"The struggle by municipalities to deliver basic services has increasingly resulted in local communities turning to private companies, development institutions and NGOs to address these challenges."

– KHANYISILE KWEYAMA, EXECUTIVE DIRECTOR FOR ANGLO AMERICAN IN SOUTH AFRICA

ICF CEO William Asiko says that when services such as water, electricity, road maintenance, sanitation and waste management are provided in an efficient and reliable manner, businesses are attracted to invest, providing jobs and contributing to the local economy.

"The commitment of the Municipal Councils, through their financial contribution and their willingness to bring lasting change to their local communities, gives ICF the assurance that the reforms being implemented will be sustainable," he adds.

"As partners, we anticipate that the stabilisation of the business climate at municipal level will also provide a foundation for entrepreneurship and new businesses, which could help achieve higher levels of local employment and local procurement"

DBSA CEO Patrick Dlamini explains that the ability of many municipalities to render services to their communities, including access to financial resources for infrastructure programmes, is under increasing pressure. "Support to municipalities as key delivery agents for social services remains an important focus area for the DBSA."

Other stakeholders involved in the programme are the provincial Departments of Cooperative Governance and Traditional Affairs, the South African Local Government Association and Treasury Departments in the Northern Cape, Limpopo, North West and Mpumalanga. Cooperative Government and Traditional Affairs minister Pravin Gordhan said that it was necessary for municipalities to focus on the basic services that communities required. "Municipalities need to serve communities better, as citizens are ultimately the final judge as to whether they are doing their job or not," he said.

01 Ntebatse Paulus, student at Sisters of Mercy Iona Convent Pretoria, drinks from the new water fountain. 02 & 03 Construction of roads and drainage infrastructure at Impali Housing Project near Shurugwe.



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01 Soil for Life assistant gardener Thomas Ruwati examines a head of broccoli he's pulled from the earth. 02 Pat Featherstone, operations director of Soil for Life, with Thomas and assistant gardener Prince Nyadimbo.

# FOOD FOR THOUGHT

An organisation that teaches people how to cultivate food gardens in their backyards in the Western Cape has been given a helping hand by Anglo American's Chairman's Fund.

While many people take a meal on the table for granted, thousands of households in the Western Cape lack regular access to food. Non-governmental organisation Soil for Life is seeking to change that by teaching families to grow their own food by creating green growing spaces.

The organisation strives to improve household food security – through nurturing a sense of goodwill and ownership in the community – and protect the environment.

"We teach people how to manage low-cost production methods which yield large amounts of vegetables, fruit and herbs from small spaces, using very little water," says Pat Featherstone, operations director of Soil for Life. This includes using innovative materials and methods, such as transforming old tyres and plastic bottles into containers that hold soil to grow vegetables like spinach and cabbage.

The Soil for Life train-the-trainer programme provides committed and promising home gardeners with training to teach and support others within the community.

Anglo American's Chairman's Fund, through which the Group channels much of its social investment spend in South Africa, has been involved with Soil for Life for the past four years and has funded the food gardening enterprise and home gardening programme.

"Funding from the Chairman's Fund has enabled Soil for Life to further develop and strengthen its programmes," explains Pat.

With the help of the Anglo American Chairman's Fund, Soil for Life has trained 1,577 people to start their own food gardens, with almost 9,462 people benefiting indirectly. Over 1,162 people have benefited from the life-skills training programme which is also run by the organisation.

"We teach people how to manage low-cost production methods which yield large amounts of vegetables, fruit and herbs from small spaces, using very little water."

– PAT FEATHERSTONE, OPERATIONS DIRECTOR: SOIL FOR LIFE

"But it's no good training people and leaving them, so our home gardeners fall into our four-year follow-up programme," says Pat. "Last year we did about 2,700 home visits, checking to see whether they were doing it correctly, whether they were still motivated and what their requirements were."

Soil for Life uses methods such as gardening without the use of harmful chemicals to produce small-scale organic food and herbs. People also learn how to improve soil and recycle waste, as well as nursery skills and plant propagation. In addition, the programme teaches people about nutrition and food processing and preserving.

"We also really want to help build people's entrepreneurial skills by teaching them how to set up local markets and run small businesses," explains Pat.

Says Norman Mbazima, chairperson of Anglo American's Chairman's Fund: "Our mission is to partner with organisations such as Soil for Life to help address the country's developmental challenges and use our resources to support and add value to practical interventions that benefit communities."

Pat says the programme is really making a difference to people's lives, particularly their self-esteem: "I think if we had more people feeling better about themselves, we'd have fewer broken communities."

### SOIL FOR LIFE BY NUMBERS

**1,577**  
HOME GARDENERS TRAINED

**1,162**  
BENEFITED FROM LIFE-SKILLS TRAINING

**2,700**  
HOME FOLLOW-UP VISITS

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### WINNING SITUATION

The Anglo American Chairman's Fund has been named the top corporate social investment grant-maker in SA for **eight consecutive years**.

Since its **establishment in the 1950s**, assistance from the fund has ranged from **small grassroots initiatives** to major capital building projects and **large-scale service delivery programmes**, in partnership with provincial and national authorities.



To watch a video on how Soil for Life helps communities to grow a sustainable future, scan the QR code on the right with your smartphone.



01 An aerial shot of the Naledi Trust community. 02 The fuel cell area before handover to the Naledi Trust. 03 Nazeem Karrim from Ballard showing Anglo American Platinum CEO Chris Griffith and Deputy Minister of the Department of Mineral Resources Godfrey Oliphant the fuel cell bank.

# POWERING UP COMMUNITIES

New fuel cell technology using platinum is generating electricity in remote areas.

For millions of households across South Africa, lack of access to electricity has a profoundly negative social and economic impact. Most rely on hazardous materials such as paraffin and wood for cooking and heating. A lack of electricity in homes and schools impacts the quality of education; food goes to waste without refrigeration, while farmers have difficulty irrigating their lands and generating income.

But in the Naledi Trust community, part of the Moqhaka Local Municipality in the Free State, Anglo American Platinum has

partnered with Ballard Power Systems, power utility Eskom, the University of the Witwatersrand and South Africa's Department of Energy to trial new technologies using platinum in fuel cells to generate electricity in remote areas.

"Platinum fuel cells offer an efficient, low-carbon, low-noise option for rural communities compared with diesel generators," says Andrew Hinkly, executive head of marketing at Anglo American Platinum. "Unlike other green alternatives such as solar or wind power, these fuel cells can produce power whenever the

demand exists and without reliance on weather conditions."

The Naledi Trust community was identified by the Department of Energy as a suitable site for a field trial, as it's been without power since 2009. The trial presented an opportunity to make a positive difference to this community.

In a world first, the system is being tested as a way to provide electricity to remote communities where the cost of electrification by expansion of the national grid is more costly or technically prohibitive. It will supply 34 Naledi households with electricity over a 12-month period through an independent mini-grid. This will generate sufficient energy for residents to power their TVs, radios, lighting, refrigerators and stoves, and to charge their mobile phones.

"This is a first-of-its-kind in South Africa and is ideal for low-to medium-density communities that are approximately 8km away from existing power transmission lines and in difficult terrain, of which there are many," says Andrew. "Fuel cell mini-grids are best suited to communities that are made up of 50 to 200 households, consuming up to 3kWh of power daily."

The technology used to power the Naledi Trust community consists of three platinum-based, 5kW fuel cell stacks, each with a methanol reformer. They're integrated into a power generation system that includes batteries, DC/AC inverters, controls and a methanol fuel supply tank.

The system is designed to provide a total of 15kW of fuel cell-generated electric power and can generate peak power of 70kW with the support of batteries – enough to power the 34 homes in this rural community. Monthly delivery of liquid methanol fuel to an external storage tank enables uninterrupted primary power to these homes.

"The field trial is intended to validate the technical and operating requirements of a home generator product for off-grid applications in South Africa," says Andrew. "Other important factors also being assessed include the logistics of fuel delivery and rural consumer electricity usage patterns, as well as ongoing product maintenance requirements."

## The bigger picture

The Department of Energy committed R3.5 billion in 2013 for the electrification of South African households by 2025. This is to be achieved through the extension of the existing grid by constructing new power transmission lines to communities and providing solar units for individual homes.

However, fuel cell mini-grid technology is a cost-competitive alternative to grid electrification in these remote areas and could accelerate access to electricity. It's estimated that over 2 million households lack access to grid power, with over 1 million located in rural communities. This means a potential market of at least 600,000 South African households in areas where grid connection is uneconomical due to difficult terrain. In addition, approximately 20,000 schools and clinics in remote rural areas lack electrification due to the significant cost of extending existing grid power.

"Access to reliable, low-cost and clean electricity is a vital component of the social and economic well-being of our community," says Moqhaka's executive mayor, Justice Mareka.

The market for fuel cell power generation extends far beyond the borders of our country, with an estimated 82 million households in Africa still without electricity.

**"The use of platinum fuel cells will support the demand for South African platinum, which is key to the sustainability of the platinum mining industry, as well as hundreds of thousands of direct and indirect jobs."**

– ANDREW HINKLY, EXECUTIVE HEAD OF MARKETING: ANGLIO AMERICAN PLATINUM

## New industry, creating jobs

Platinum-based fuel cells could provide significant economic and environmental development opportunities for South Africa by facilitating the provision of clean, reliable and cost-effective power.

Andrew adds that the project has the potential to create a new high-tech manufacturing sector in the country: "Thousands of jobs could be created throughout the platinum fuel cell value chain if the technology's deployed for rural electrification."

Employment opportunities include component manufacture, assembly and integration, design, installation, servicing and maintenance, as well as fuel supply. This aligns with the objectives set out by government's National Development Plan and would not only create jobs, but also develop a new market for platinum group metals, in turn supporting and sustaining mining jobs.

"The entire fuel cell value chain could be located in South Africa once sufficient scale is reached," says Godfrey Oliphant, Deputy Minister in the Department of Mineral Resources. "In turn, a number of manufacturing and service jobs can be created from this initiative, providing an opportunity for the export of value-added products to other emerging markets."

It also significantly supports the South African Beneficiation Strategy by creating additional platinum demand of up to 7,500oz over 15 years through the creation of a new market.

"The use of platinum fuel cells will support the demand for South African platinum, which is key to the sustainability of the platinum mining industry, as well as creating hundreds of thousands of direct and indirect jobs," says Andrew.

It's also likely that the industry will grow to include the manufacture of other fuel cell products in stationary, transport and portable applications – not only for the South African market, but also for export to the rest of Africa and other parts of the world.



# FIGHTING FATIGUE

Kumba Iron Ore's Kolomela Mine charts the way forward in fatigue management.

In the mining industry, fatigue is not only dangerous – it can also be fatal. Tired miners can make mistakes, causing injuries and fatalities. Fatigue also impacts productivity, sickness and absenteeism. In an innovative approach to fatigue management, Kumba Iron Ore's Kolomela Mine has pioneered new safety technology by building a state-of-the-art Fatigue Management Centre, the first of its kind in Africa.

"Fatigue is one of the major causes of safety incidents in mining," says Satchmore Muchiriri, manager of safety at Kolomela mine. "We wanted to use a scientific approach and build a centre with a particular focus on shift workers using heavy mining equipment"

Medical evidence suggests that for optimum health and function, the average adult should get seven to nine hours of sleep daily. This isn't always possible – especially for night shift workers. In its early stages, sleep deprivation can lead to a feeling of fuzzy-headedness and irritability. As fatigue increases and sleep debt mounts, the health consequences increase, putting workers at growing risk of weight gain, diabetes, heart disease, stroke and memory loss.

"The effects of fatigue can be devastating – just 21 hours awake gives a person the response time of an individual who's legally drunk," explains Satchmore. "That can be deadly on the job."

Because shift work is especially disruptive to the body's natural circadian clock – the processes that regulate the body's daily rhythm, including fluctuations in temperature, blood pressure, levels of digestive enzymes and various hormones – the Kolomela Fatigue Management centre has been designed with this in mind. Workers go through six steps in the fatigue centre, first visiting the nurse for an assessment to see whether they are fit for duty.

They are then able to catch a 20-minute power nap on the recliner chairs at the nap station. Afterwards, they can do the Prism test (BLT testing). Bright lights mimic sunshine especially during night shifts to "awaken" their bodies and a gym provides an opportunity to exercise. A clinic and cafeteria with nutritional supplements are also made available to workers. "The centre provides a complete support structure to help miners combat fatigue," says Satchmore.

## Shifting production schedules

Up-to-date productivity management is increasingly taking the psychological as well as physiological well-being of the workforce into account. To reach optimal levels of mental performance, factors such as circadian rhythms and proper shift management are being considered in the workplace.

"At Kolomela, the new technology, Prism, links into the clocking system of the mine and alerts supervisors via SMS if operators are working longer hours than scheduled," says Satchmore.

Work schedules are run through a system (FIRM) which pin-points key fatigue times and plans accordingly. Most people experience a "sleepiness" peak between midnight and 06:00 and a minor one between 14:00 and 16:00, although individuals vary.

"The best schedules are ones that provide for proper sleep and reduce consecutive night shifts," Satchmore explains.

Other factors taken into consideration include providing more water stations so workers can drink water and splash their faces to remain alert.

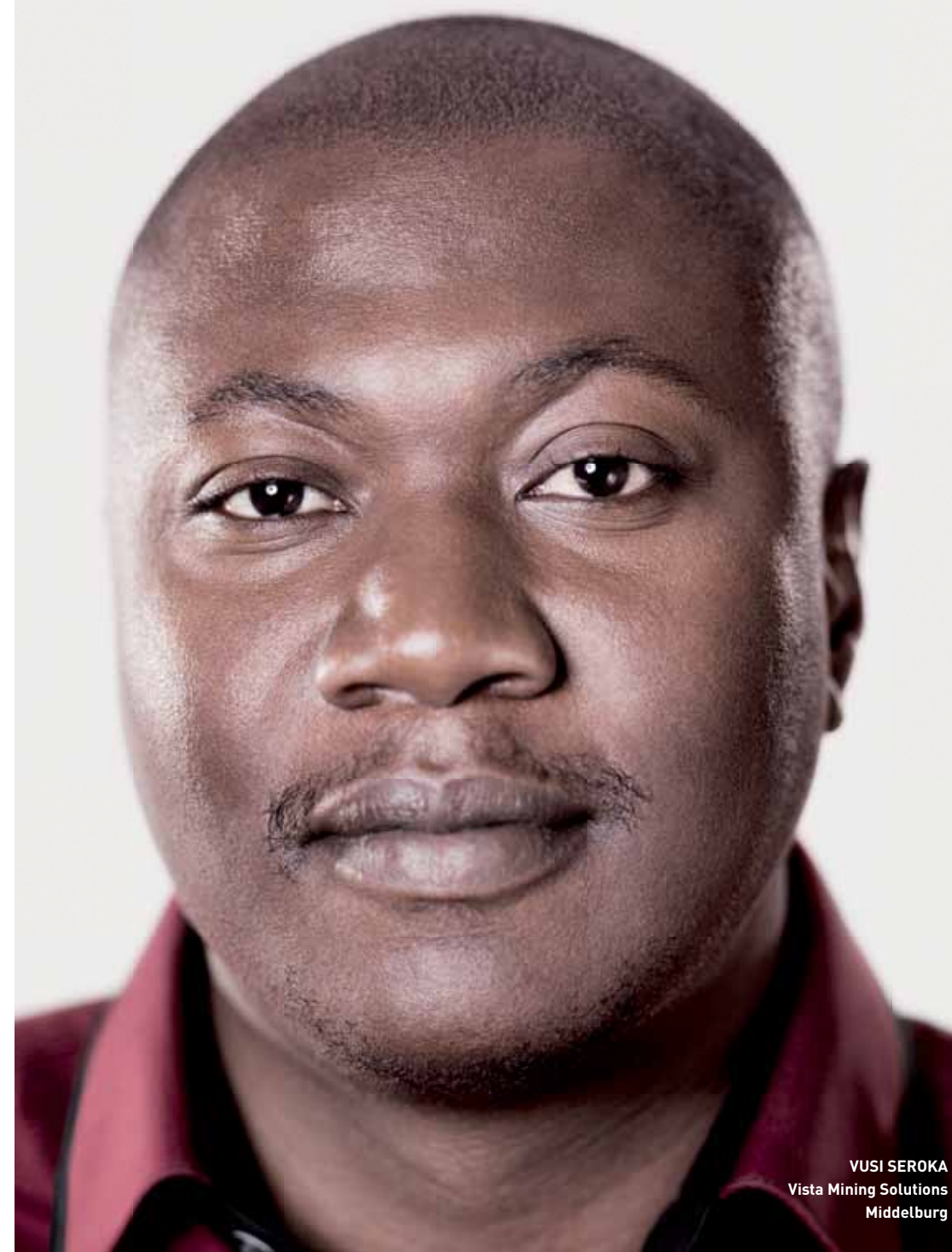
"But while it is possible for mines to improve workers' alertness," says Satchmore, "the only real treatment for fatigue is sleep."

He adds that individuals can get into a state of sleep debt, which can take many weeks to overcome.

For this reason, the living conditions of workers are also taken into account and nurses in the centre advise on how best to improve their routine and lifestyle to fight fatigue most effectively. Apart from technology that monitors employees' alertness, a team of professionals is also trained to conduct health assessments and provide counselling, as well as lifestyle and dietary advice. They lead awareness and education campaigns for employees, their families and the community. A registered nurse is on duty during all shifts and is trained to conduct confidential health assessments that can identify possible health factors leading to fatigue. This allows preventative measures to be put in place.

The centre has been internationally recognised and, as such, is only one of two mines at Anglo American worldwide. Only a handful of other mining companies across the world apply this safety technology.

"When we started off there was an increase in productivity and the fatigue programme, along with other programmes, contributed towards this change," says Satchmore. "Since the centre began operating in June last year, employees have become far more aware of the dangers of fatigue, report it as such and we are able to further minimise risk at Kolomela."



VUSI SEROKA  
Vista Mining Solutions  
Middelburg

We believe that the best way to make a sustainable difference is by supporting those with great ideas. That's why, through Zimele, we have already helped turn 1 619 great ideas into sustainable small businesses.

Vusi Seroka came to the Middelburg small business hub with an idea to start a business. But without any practical experience or a formal education he didn't know where to start. The Zimele hub manager listened to his idea and together they developed a business plan. Vusi's application was successful and he was granted R25 000, one of seven such loans from Zimele.

With a total of R1.5 million in loans, Vusi now owns a thriving business with 45 employees from his community, and counting.

Where there is mining there is growth. Anglo American wants to make sure South Africans benefit.

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