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MINING WEEKLY



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REAL ECONOMY YEAR BOOK 2015

A worker at Wesizwe's Bakubung platinum mine, in South Africa's North West province

Picture by Chief Photographer Duane Daws

Replicating renewables

There are very few beacons of hope on South Africa's economic horizon. Economic growth is weak, unemployment is rising, electricity supply is insufficient to meet demand and/or spur growth, with poor prospects for many of the commodities mined and exported.

However, South Africa is performing relatively well in one key infrastructure area – the renewable-energy sector.

Since 2012, government has successfully procured 5 243 MW of renewable-energy capacity across 92 individual projects.

Thirty-eight of these facilities are delivering electricity into the grid, with the majority of the projects having been delivered either on or ahead of time, and within budget.

South Africa's internationally acclaimed Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has also resulted in investment commitments of R193-billion, making it the most successful public-private partnership programme undertaken in South Africa.

The Independent Power Producer Office, comprising officials from the Department of Energy and the National Treasury, supported by a strong team of technical, legal and financial advisers, oversees the programme.

Despite some delays and periods of frustration, there is broad consensus that the REIPPPP has been run efficiently and, importantly, reputably.

In addition, the tariffs bid have fallen markedly during the four bid windows. Prices associated with wind projects in the last round (bid window four) have dropped by more than 70%, compared with those of the first bid window. Similarly, solar photovoltaic tariffs have declined by about 60% over the period.

Such is government's confidence in the programme that it will now also proceed with a so-called 'expedited' procurement process, whereby projects that narrowly missed selection during the first four bidding rounds will be given a second opportunity to bid – the intention is to procure a further 1 800 MW before the end of 2015.

The competitive-bidding model is also being extended to other sources of supply, including baseload coal and cogeneration capacity, with tenders out for both solutions. Gas-to-power is also likely to be added to the mix.

Given this success and the importance of infrastructure in helping to restimulate growth in South Africa, it might be well worth considering the feasibility of replicating this successful renewables public-private partnership template to other revenue-generating infrastructure areas.

Martin Greamer

Industrial

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Automotive

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Picture by Chief Photographer Duane Davis

While new-vehicle sales showed a slight decline of 0.7% to 644 504 in 2014, the National Association of Automobile Manufacturers of South Africa is relatively upbeat regarding new-vehicle sales in 2015. Sales in South Africa are expected to register marginal growth for the year, rising to 671 000.

Construction

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The construction industry continues to be a key sector in South Africa's economy, however, analysts believe that if government is to make inroads into the backlog of projects in its portfolio, a proactive partnership with the construction sector needs to be developed.

Electricity

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Picture by Chief Photographer Duane Davis

While the South African government has implemented a capacity expansion programme, the power system is expected to remain constrained for the foreseeable future, owing to decades of underinvestment in ageing power plants and delays in the completion of major new power stations.

Road & Rail

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Picture by Chief Photographer Duane Davis

Government continues to invest in improving and expanding road and rail infrastructure, as well as on promoting the movement of more freight away from being transported on roads and onto rail.

Steel

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Picture by Chief Photographer Duane Davis

China is still the biggest producer and consumer of steel and, as a result, its moderating economic growth rate is expected to have an impact on South Africa's and the global steel sector.

Water

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Source: TCTA

Water is now considered a bigger global risk than inter-State conflict, the failure to adapt to climate change and chronic unemployment. The South African government and experts have agreed that changes are required to ensure South Africa has a water secure future.

REAL ECONOMY YEAR BOOK

Mining

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Coal

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Picture by Chief Photographer Duane Davis

The past few years have been challenging for the global coal industry. It has shown significant financial underperformance since 2011. Nonetheless, it is expected that coal will remain one of the primary energy sources in the world for the foreseeable future.

Gold

28



Source: Bloomberg

Despite the decline in South Africa's gold production and the ongoing challenges facing the sector, gold mining remains an important part of the country's economy. It is believed, however, that the development of new technologies will be essential for the future of the industry.

Iron-Ore

31



Source: Bloomberg

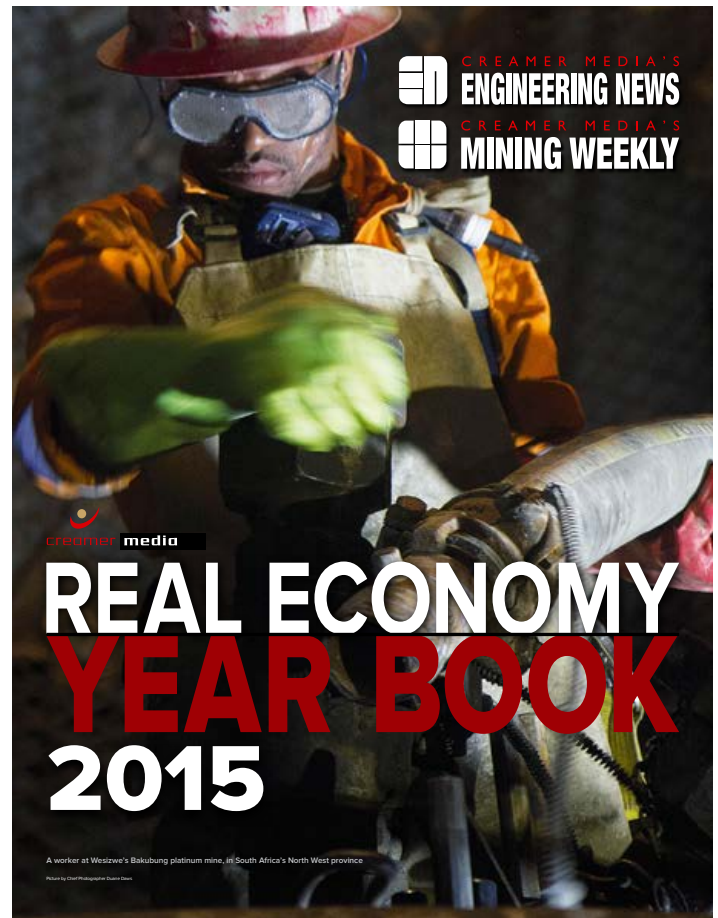
Iron-ore miners, like producers of other commodities, are adjusting to the reality that years of a commodity supercycle driven by a robustly growing China might be over.

Platinum

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Rising costs, labour unrest and persistent weakness in the platinum market have pushed the industry into radical restructuring, with companies selling off underperforming assets, closing old shafts and reviving arguments for mechanisation, automation and modernisation of the country's deep-level, labour-intensive underground mines.



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MINING WEEKLY

INDUSTRIAL INDEX

Automotive



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Steel



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Water



Picture by Chief Photographer Duane Daws

AUTOMOTIVE

SHONA KOHLER
CREAMER MEDIA RESEARCH ASSOCIATE

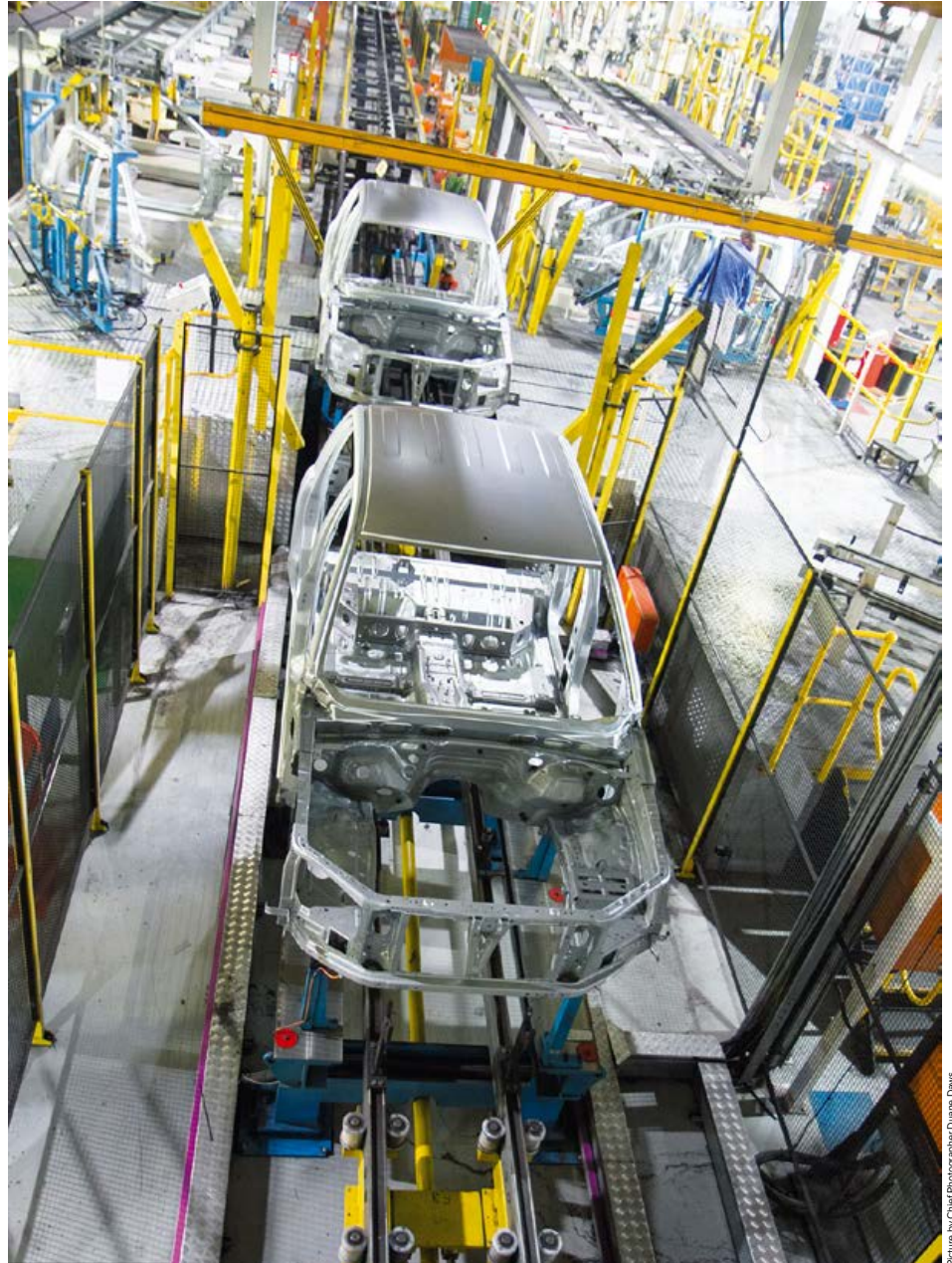
South African automotive consumers are spoilt for choice, as they have the largest choice to market size ratio in the world. In 2014, there were more than 55 brands and more than 4 400 model derivatives available to South African consumers in the new-passenger-car market. In the light commercial vehicle (LCV) segment, there were 31 brands and 615 model derivatives from which to choose.

Figures from the National Association of Automobile Manufacturers of South Africa (Naamsa) show that 644 504 new vehicles were sold in the country in 2014, marking a slight year-on-year decline on the sales recorded in 2013. The 0.7% decline was the first recorded since 2009. Nevertheless, new-vehicle sales turnover grew by 9.8% in 2014 to R225-billion.

Factors contributing to fewer vehicles having been sold in 2014 include that the vehicle replacement cycle – in terms of which owners replace their vehicles, owing to age or mileage – seemingly reached its end in 2013. Sales were also subdued because of factors that negatively affected the affordability of and demand for vehicle finance, including the slowdown in the domestic economy, and two recent interest rate increases. Further, new-vehicle price increases have been above inflation. Vehicle importers have been more affected by price increases, as they tend to move more aggressively on pricing, compared with local vehicle manufacturers, as the rand weakens. However, local manufacturers have also been affected by the devaluation of the rand, owing to significant cost increases in imported parts.

In 2014, South Africa's automotive industry produced 566 083 vehicles, including 277 491 passenger cars and 255 629 LCVs. Total vehicle production was 3.7% up on production in 2013, passenger car production increased by 4.7%, and LCV production by 2.9%.

The major car and LCV manufacturers active in South Africa include the local subsidiaries of seven global automotive



Picture by Chief Photographer/Diane Dawes

companies – BMW, Ford, General Motors, Daimler (Mercedes-Benz), Nissan, Toyota and Volkswagen. Several dedicated truck assemblers, including Fuso, Freightliner, MAN, Tata, Isuzu Trucks, Hino, Volvo, Renault, Hyundai, FAW and UD Trucks, are also active in South Africa.

South Africa's automotive industry, including vehicle manufacturers and after-market participants, use a combination of

locally manufactured and imported components. The local-components industry consists of about 500 companies, including 120 first-tier suppliers. The National Association of Automotive Component and Allied Manufacturers (Naacam) estimates that South Africa's component manufacturing sector recorded turnover of about R78.4-billion in 2014 and undertook capital expenditure of R2.7-billion.

Revisions and Expansions to Sector Support

Globally, it is the norm for governments to offer support to their automotive industries, with most countries offering a range of support measures to vehicle manufacturers. They do so because of the investment required to establish an automotive plant, the number of jobs an automotive industry creates and the multiplier effect on the broader economy.

South Africa has been supporting its automotive industry since 1961. Currently, this support comprises the Automotive Production and Development Programme (APDP), which entered full effect at the beginning of 2013 and will continue until 2020.

One of the four key elements of the APDP is the Automotive Investment Scheme (AIS). In 2012, the Department of Trade and Industry (DTI) released the People-Carrying Automotive Investment Scheme (P-AIS) as a subcomponent of the AIS, with a specific focus on the minibus and taxi segment. Further, in July 2014, Trade and Industry Minister Dr **Rob Davies** approved revised guidelines for the AIS and P-AIS. In October 2014, government released guidelines for the Medium and Heavy Commercial Vehicles Automotive Investment Scheme to stimulate investment in the production of these vehicles in South Africa.

Meanwhile, the APDP has undergone a review, the outcomes of which are expected in about mid-2015. The need for policy stability and certainty was critical in the review process, as demanded by international vehicle manufacturers, whose investments are based on the incentives available under the scheme as it currently stands.

The review also has an assessment of the incentives available for automotive component manufacturers. Former Naacam executive director **Roger Pitot**, who serves as an adviser to the DTI on the APDP, has noted that component manufacturers are generally “not happy” with the APDP and that some have had to close down, owing to the reduced benefits available under the programme, compared with the benefits that were available under the previous incentive scheme.

Other competing demands that the review has to consider include union demands for jobs, international competitive-

ness concerns and the cost of the incentives to the national fiscus.

It is expected that beyond 2020, when the APDP is set to end, the DTI will continue to support the local automotive industry. Companies in the components industry contend that a post-2020 support programme will need to be substantially different from the APDP. Components company Metair Investments has indicated that a new programme will have to be proposed within the next 18 to 24 months. This will provide the South African automotive industry with the certainty required to make investment decisions, while allowing for adequate time to adjust to the new policy.

Competitiveness

The competitiveness of South Africa's automotive industry has been significantly boosted by the APDP. Ford Motor Company of Southern Africa, for example, has noted that the incentives provided by the programme have made South Africa an attractive investment destination for the industry.

Despite the benefits offered by the APDP, however, competitiveness remains a major challenge for companies operating in South Africa. Naacam president **Mpueleng Poee** contends that competitiveness is “the biggest challenge facing the South African automotive industry” and that “[the lack of] competitiveness of the industry remains the key inhibitor to growth and is a growing concern, based on the shift towards vehicle manufacturing in low-cost countries”. Poee's statement applies to the automotive assembly and components sectors.

Competitiveness concerns are evident in company assessments of future investments in South Africa. For example, Datsun global head **Vincent Cobee** has described South Africa as the “logical choice” when it comes to the establishment of vehicle manufacturing operations that target the African automotive market, but has cautioned that the country will first need to significantly overhaul its level of competitiveness.

A particular challenge is South Africa's precarious electricity supply. Naamsa, in a review of business conditions in the first quarter of 2015, notes that the “key imponderable” regarding the outlook for the automotive industry relates to the “security and stability of electricity supply”. For several

years, South Africa has been experiencing electricity supply shortages, owing to insufficient electricity generation capacity, with these becoming particularly significant in early 2015.

While South Africa's electricity shortages represent an obstacle to production, companies active in the local automotive industry contend that a far more significant challenge is the country's labour force. Mercedes-Benz South Africa (MBSA), for example, has identified labour instability as the biggest challenge to its producing C-Class vehicles in the country.

This observation follows two years during which the automotive industry experienced several major disruptions, owing to labour action. During that time, up to 13 weeks of vehicle production was lost because of strikes, including at assembly plants and component manufacturers, and in related sectors such as metals and engineering and logistics.

Companies have decried the impact of labour action on their operations. Toyota South Africa Motors' (TSAM's) president and CEO Dr **Johan van Zyl** has said: “There is no way we can do that again. That was an incredibly bad period.” MBSA has said that another major strike in the industry “will have a more critical impact than what most people will even be able to contemplate – it is a very serious matter”. Naamsa has noted that the disruptions to production caused by labour action have “severely dented the industry's reputation and track record as a reliable supplier to international markets”. Vehicle manufacturers will take South Africa's labour situation into account when considering possible additional production opportunities in the country.

The industry is set to embark on new wage negotiations in 2016, when the current three-year wage deal comes to an end. However, by early 2015, Naamsa was involved in talks with the unions on how to approach the 2016 negotiations more productively.

The wages in the local automotive industry are higher than in other competing developing countries. However, it is expected that the 2016 wage settlement is unlikely to be at a level lower than the 8% to 10% a year increases agreed to in the 2013 wage deals in the retail, components and assembly sectors. Nissan SA president **Mike Whitfield** says the social imperative in South Africa to “close the wage gap” will probably result

in future wage increases continuing to “run ahead of inflation”.

Motor companies have expressed concern that the high wage increases in the South African automotive industry do not necessarily lead to increased productivity. South Africa's labour costs are relatively high when compared with those of other vehicle manufacturing countries; therefore, if an increase in wages is not mirrored by an increase in productivity, high labour costs impact negatively on competitiveness.

Another labour-related challenge affecting the competitiveness of South Africa's automotive industry is the skills shortage at assembly plants and suppliers. BMW South Africa has identified this as one of the major challenges it faces in the production of vehicles in South Africa. Several automotive companies are involved in efforts to ensure that the required skills are available to them. For example, MBSA has announced that, through National Treasury's Jobs Fund, R130-million will be spent on building a learning academy in East London, in the Eastern Cape. The facility will address the MBSA plant's technical needs and those of the region by training electricians, fitters and mechanics, among other skills sets. The academy is expected to open towards the end of 2015.

The difficulties automotive companies face in achieving economies of scale also affects competitiveness. They have also noted logistics as an area in which improvements are required. Volkswagen Group South Africa MD **David Powels** stated in early 2015 that the South African supply chain, including participants, such as port and rail authorities and logistics service providers, would do well to improve its efficiencies.

Poore contends that the fate of South Africa's automotive industry lies in understanding the competitiveness challenge facing the country.

Contributing to such an understanding, Van Zyl has noted that, while South Africa's automotive industry does have several strengths, the country's natural advantage lies neither in the design and development of new vehicles nor in manufacturing, logistics, vehicle sales or aftersales service. He contends that, instead, the only real competitive advantage the local automotive industry has in comparison to international competitors is the availability of natural resources, thus, “the beneficiation of our

Closure of any local assembly plant ‘a disaster’ – Van Zyl

In March, Toyota South Africa Motors president and CEO Dr **Johan van Zyl**, who is also the president of the National Association of Automobile Manufacturers of South Africa, noted that the closure of any vehicle manufacturer's operations in South Africa would be a “total disaster”.

He stated that South Africa's automotive manufacturing industry was “very much like” the industry in Australia, which was set to close down by 2018, owing to decreased government support, rising costs and shrinking volumes.

“We can't lose anyone. If one [manufacturer] leaves it would have a domino effect.”

Van Zyl contended that it would be impossible to sustain the South African components supplier base, should vehicle production volumes deteriorate, owing to the departure of a manufacturer.

“Slowly, but surely, things will just die.”

While vehicle manufacturers do not use the same wiring harness, for example, the number of manufacturers in South Africa ensure sufficient shared volume for a wiring-harness producer to set up shop locally.

Van Zyl emphasised that the closure of any local plant would not result in the remaining vehicle manufacturers gaining market share, as had been hinted at by some market commentators.

Source: *Engineering News*

mineral resources is key”. Van Zyl adds that, for example, South Africa uses its lead resources optimally in the production of car batteries. However, it does not use iron-ore, locally produced resin, or copper in the same manner. To encourage this, it is necessary to sell and build more cars locally, and to invest in, and develop the skills and technology base needed to increase the local-parts content of vehicles built in South Africa. This, of course, requires reliable electricity supply and a stable labour force.

While South Africa is facing major challenges to its competitiveness, other African countries are increasingly welcoming investors. General Motors Africa president **Mario Spangenberg** has noted that these countries are working hard to become more investor friendly, and South Africa has to take note of this.

Nigeria is the first African country outside South Africa to produce a local vehicle-manufacturing plant, with Nissan becoming the first major manufacturer to build a car in that country, following the announcement of the Nigeria Automotive Policy. Ford Motor Company is also mulling vehicle assembly in Nigeria and is in talks with the Nigerian government about the content of its policy. Toyota has indicated that it will study the economic merits of manufacturing vehicles in Nigeria.

Nissan and Ford have indicated that a complementary relationship could exist between South African and Nigerian automotive plants. Nissan has shown this in practice, with its South African plant providing its Nigerian plant with kits to

produce the NP300 pick-up vehicle. Ford has noted that manufacturing facilities elsewhere in Africa could enable South African components companies to export their products to these locations.

However, the South African automotive industry has been cautioned that to “do nothing” in response to the rise of the Nigerian automotive industry would be very problematic. B&M Analysts MD **Douglas Comrie** has noted that a rival assembly industry could diminish South Africa to “an island”, selling vehicles only to its own population, instead of exporting vehicles to the rest of Africa.

Prospects

TSAM marketing and sales senior VP **Calvyn Hamman** noted in late 2014 that “[the automotive industry is] not in a downwards cycle. The market is more nervous than negative”. TSAM's Van Zyl echoed this sentiment, noting that “this is not doom and gloom”. Naamsa is relatively upbeat regarding new-vehicle sales in 2015, with the association noting in March that it expected new-vehicle sales in South Africa to register marginal growth for the year, rising to 671 000.

Naamsa expects that vehicle production in South Africa will increase to 627 500 vehicles in 2015. Passenger-car production for the year is expected to rise to 320 000 units, and LCV production is expected to reach 273 000 units.

CONSTRUCTION

SHEILA BARRADAS
CREAMER MEDIA RESEARCH COORDINATOR
& SENIOR DEPUTY EDITOR

The construction sector serves all segments of the economy and is highly labour intensive. It is a multifaceted sector comprising general building construction, industrial construction, commercial building construction and heavy civil construction.

In addition to new construction projects, the work scope of the sector also includes additions and modifications to existing structures, constructing temporary edifices and prefabricated buildings, as well as assembling and dismantling scaffolding.

Companies that are active in the South African construction industry and in projects beyond the country's borders include listed billion-rand-plus turnover groups such as Aveng, Basil Read, Esor, Group Five, Murray & Roberts, Raubex, Stefanutti Stocks and Wilson Bayly Holmes-Ovcon. Small companies, some of which operate informally, pursue smaller-scale projects that subsequently complement these groups.

Construction in South Africa's Public Sector

While the construction sector remains a sizeable economic contributor to and employment provider for South Africa's economy, it has been in a slump for the past seven years. It has struggled to recover to the growth levels achieved in the build-up to the 2010 FIFA World Cup, when billions of rands were invested in projects associated with hosting the soccer tournament.

Construction-sector investment decline started in 2008, but the turning point was in 2010, when investment plunged by 11.8% year-on-year. Since then, investment has not shown any significant growth in real terms, achieving an average yearly increase of just 0.2% from 2011 to 2013. Consulting firm PwC notes that increased government spend on construction from 2010 to 2014 was a mere 5.7%, which was lower than

the inflation rate. The firm expects the percentage to drop to 4.5% in 2016.

However, some industry players believe that the construction industry is showing signs of recovery, with expected government infrastructure expenditure, retail developments and residential building projects to boost the industry to a level considerably higher than that of 2014.

According to the South African Reserve Bank's (SARB's) Quarterly Bulletin – March 2015, the real value added by the construction sector progressed at an annualised rate of 3.5% in the fourth quarter of 2014, compared with a rate of 2.2% in the third quarter. Civil construction activity in the public sector maintained its underlying upward momentum, driven by general government spending on the construction and upgrading of roads, schools and hospitals. Activity in the residential and nonresidential building industry also increased in the quarter. The SARB indicates that the real value added by the construction sector in 2014 increased by 2.9% – well above the growth rates recorded in the other construction sectors.

However, the First National Bank/Bureau for Economic Research (FNB/BER) Building Confidence Index, released in March, stated

that the recovery in the building sector, after it had accelerated towards the end of 2014, seemed to have lost some momentum in the first quarter of 2015, with the index dropping from 60 to 55 points.

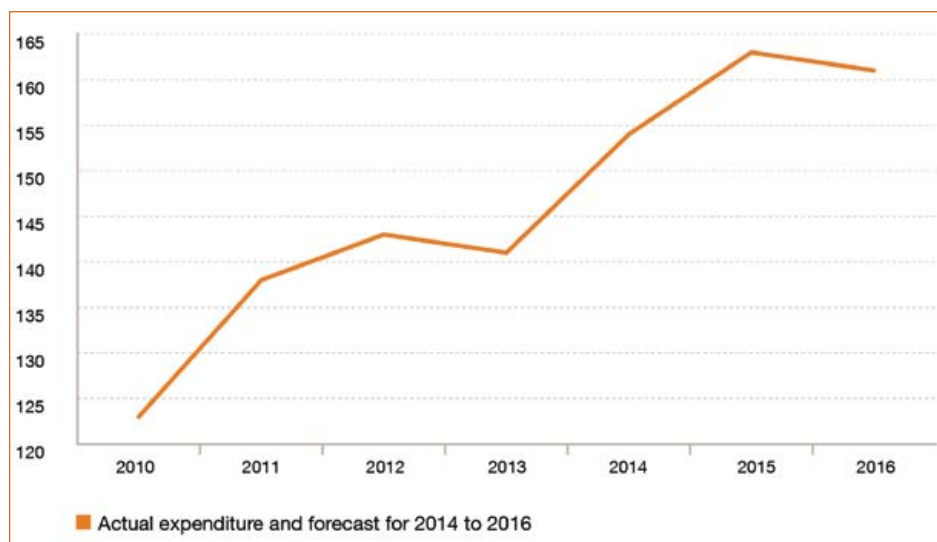
The decline in overall confidence was partially because of a significant decrease in residential building activity, which negatively affected the confidence of the sector, particularly contractors and manufacturers.

Meanwhile, the building pipeline delivered mixed results, adding to the uncertainty regarding the outlook for the sector. However, the FNB/BER noted that, despite the decline in overall confidence, the index remained above 50 points.

The South African government's ongoing National Development Plan (NDP) and its continued commitment to public infrastructure investment of R847-billion over the next three years are deemed positive signals for future growth in the construction industry. The NDP includes plans to build 1.5-million houses in the next six years, with a yearly investment of between R30-billion and R35-billion already allocated for this purpose.

According to materials-handling machines

Public expenditure: New construction, property development and major rejuvenation (R-billions) – 2010 to 2016



Source: PwC – SA Construction 2014

manufacturer, distributor and exporter Bell Equipment marketing and sales director **Terry Gillham**, the NDP is the single biggest opportunity for the construction industry in South Africa. "If government implements [the NDP], not necessarily in its entirety, but at least 60% to 70% of it, that would certainly be a massive boost for the construction industry in South Africa," he says.

Other well-documented public-sector plans to upgrade and expand road, rail, power generation and water infrastructure, besides others, are expected to further unlock the construction industry. According to the medium-term expenditure framework (MTEF) communicated in South Africa's 2014 Budget, the major State-owned companies, which include Eskom, Transnet and South Africa National Roads Agency Limited,

are forecast to spend R381.8-billion.

Nonetheless, construction and engineering group **Aveng** CEO **Kobus Verster** said in February that the company faced weak markets in almost every sector. He added that low national infrastructure spend in South Africa, coupled with overcapacity in the construction market and low margins, had made it difficult for Aveng subsidiary Grinaker-LTA to execute its long-standing turnaround strategy.

Meanwhile, construction major **Basil Read** CEO **Neville Nicolau**, has stated that, while South Africa is "desperate" for increased infrastructure build, there is a disconnect between government, labour and the construction industry, which is impeding the progress of projects required to meet the country's energy, transport and

public-service needs.

Speaking at the Captains of Construction Leadership forum in May, Nicolau noted that the local construction industry was at the bottom of a cycle, which was impelling many local companies to pursue construction opportunities in the rest of Africa and beyond.

Engineering consultancy **Knight Piésold** MD **Leon Furstenburg** told the forum that infrastructure project development was being further debilitated by a lack of coordination between companies, government and individuals, as these parties appeared to plan and develop in silos. Nicolau commented that government no longer trusted the formal construction sector, owing to findings of collusion among the country's largest construction companies in 2013.



Collusion in the Construction Sector

At the Captains of Construction Leadership forum, Nicolau further urged government to move beyond its mistrust of the construction industry.

"From the industry's point of view, it's time that we put the collusion matter

aside. It was tens of projects among the thousands of projects completed. We've admitted our guilt, we've paid our fines and it's now time that we move forward," he appealed.

The Competition Commission identified 300 collusion cases in projects collectively valued at R47-billion, but limited the scope of its investigations to 160 projects from early 2006 to late 2009, eventually fining

15 construction and engineering firms a total of R1.46-billion.

The companies that incurred the largest penalties for collusive practices were Wilson Bayly Holmes-Ovcon, fined R311.29-million for 11 projects; Murray & Roberts, fined R309.05-million for 17 projects; Stefanutti Stocks, fined R306.89-million for 21 projects; and Aveng, fined R306.57-million for 17 projects.

Geographic footprint of some of the major players in South Africa's construction sector

Aveng	A construction and engineering group, specialising in energy, infrastructure and mining opportunities.	<ul style="list-style-type: none"> • South Africa • sub-Saharan Africa • Australasia • Asia
Group Five Construction	The largest cluster in the Group Five group of companies and is involved in heavy construction.	<ul style="list-style-type: none"> • Southern Africa • sub-Saharan Africa • Poland • Hungary
Basil Read Holdings	Involved in construction, mining, development and engineering, specialising in civil engineering, road construction, building, mixed integrated housing developments, property development, bitumen distribution, opencast mining, blasting operations and engineering design, procurement and construction management.	<ul style="list-style-type: none"> • South Africa • sub-Saharan Africa • South America • Australia
Esorfranki	<p>A civil engineering and construction group. The company operates through the following units:</p> <ul style="list-style-type: none"> • Geotechnical operations: Involved in the construction and provision of piling, pipe jacking, lateral support and ground improvement for the construction industry, primarily in South Africa. Operations are, however, diversely located throughout Africa. • Civils operations: Involved in the construction of roads, township infrastructures, water and sewerage reticulation and concrete projects. • Pipeline operations: Construction and rehabilitation of onshore pipelines. 	<ul style="list-style-type: none"> • South Africa • sub-Saharan Africa • Indian Ocean Islands
Murray & Roberts Holdings	An investment holding company with interests in the construction and engineering, underground mining development, construction materials and related fabrication sectors.	<ul style="list-style-type: none"> • Southern Africa • Middle East • Australasia • North America • South America • Southeast Asia
Erbacon Investment Holdings	Specialises in heavy civil engineering construction and building services. Core activities include construction and repair of reinforced concrete structures, roads and bulk earthworks, as well as the installation.	<ul style="list-style-type: none"> • Southern Africa
Stefanutti Stocks Holdings	<p>A holding company, operating through the following business units:</p> <ul style="list-style-type: none"> • Structures – encompasses the group's civil structures, geotechnical and marine capabilities. • Building – services the full scope of infrastructure construction; in the commercial, industrial, residential and leisure industries. • Roads and earthworks – construction of transport, township and mining. 	<ul style="list-style-type: none"> • South Africa • Angola • Botswana • Mozambique • Namibia • Sierra Leone • Swaziland • Zambia • Zimbabwe • United Arab Emirates
Raubex Group	An investment holding company, operating through its divisional subsidiaries, in the road construction, rehabilitation and associated infrastructure development sectors.	<ul style="list-style-type: none"> • South Africa • sub-Saharan Africa
Wilson Bayly Holmes-Ovcon	Operates as a holding company of a number of subsidiary companies principally engaged in building construction, civil engineering and roads and earthworks activities.	<ul style="list-style-type: none"> • South Africa • Southern Africa • Australia
The South African National Roads Agency (Sanral)	Undertakes construction and maintenance of roads for government.	<ul style="list-style-type: none"> • South Africa

Source: Gauteng Growth and Development Agency – Business Intelligence and Planning Unit: Construction sector fact sheet 2015

Several firms refused to settle with the Competition Commission during the initial fast-track process. These companies will now have to prove their innocence before the tribunal or face far larger fines than the ones paid in the settlement process.

However, some observers have described the fines as a slap on the wrist, and there were calls at the time for the implicated construction companies to be banned from tendering for State contracts and for their executives to be jailed. There had also been a suggestion that the Construction Industry Development Board blacklist companies that had been found guilty of collusion.

Construction in South Africa's Private Sector

The private sector, often led by the mining industry, has been a significant contributor to total construction expenditure.

Sustainable energy investments in South Africa, mainly comprising solar and wind farms, have been significant contributors to capital expenditure in the construction sector. The country's current electricity situation has placed a renewed focus on independent power producers (IPP). By 2022, an additional 17 000 MW of IPP capacity is expected to be added to the national grid from renewable-energy, cogeneration, coal and gas sources. If positioned well, construction companies could benefit from this potential investment.

However, the severe pressure to which the mining sector is subjected to, with shrinking margins, owing to volatile commodity prices and labour unrest, will impact on future demand.

Labour and Skills

According to PwC's 'SA Construction Report 2014', many CEOs in the construction sector have expressed their concern about access to key skills. In addition, 70% have expressed concern about rising labour costs in high-growth markets and 37% believe that creating a skilled workforce should be a government priority.

A list of the 100 occupations for which there is a critical shortage in South Africa was gazetted by Higher Education and

Government pioneers youth brigade programme for construction sector

Drawing on a Cuban skills development model first implemented by the island State in 1964, the Department of Human Settlements (DHS), in partnership with the National Youth Development Agency, the National Home Builders Registration Council and the Estate Agency Affairs Board, has outlined plans to establish a National Human Settlements Youth Brigade in the domestic built environment industries.

The ambitious programme aims to create organised teams of youth who would be trained in the construction and engineering sectors, driving the upskilling of the country's unemployed youth, while advancing the DHS's housing delivery target of having built 1.5-million houses by 2019.

About 5%, or about R3-billion, of the national DHS's budget will be allocated to the programme, while provincial departments are expected to contribute an additional 5% of their respective budgets.

Source: *Engineering News*

Training Minister Dr **Blade Nzimande** in May 2014. It lists electrical, civil and mechanical engineers, quantity surveyors and programme or project managers – all of whom are employed in the construction sector – as the top five occupations for which there is a serious shortage. Physical and engineering science technicians occupy seventh position, with construction project managers in eleventh position.

The skills dearth not only affects a company's ability to compete for and complete contracts but also adds to the expansion risk it faces. Similarly, staff retention is crucial to the sustainability of a company. As a result, and in line with the requirements of the Construction Charter, construction companies recognise the development of skilled labour as being critical to their sustainability.

For example, Aveng runs the Ikhaya Fundisa Techniskills Academy, in Gauteng, an artisan training institute that offers training for learners, artisans and artisan assistants in the mechanical, electrical, motor/diesel and boilermaking fields.

JSE-listed construction company Basil Read also identified skills shortages as a material issue for the company and has spent more than R13-million on training and development. The major initiatives include managerial development, as well as carpenter, health and safety, diesel mechanic and blaster training.

Owing to the prevailing market conditions, Group Five's training and development spend during the 2014 financial year focused on core skills and productivity. The overall spend that year of R32.3-million was equivalent to 1.87% of payroll.

Murray & Roberts spent R260-million on skills training and development during the 2014 financial year, up from the previous year's R156-million. This expenditure equated to 2.7% of the group's payroll and

was higher than the globally accepted benchmark of 2%.

Some commentators have suggested that construction companies' keenness to develop skills has been dampened by government not delivering the megaprojects needed to boost the economy, despite the Presidential Infrastructure Coordinating Commission having 18 strategic integrated projects on its development agenda. South African Federation of Civil Engineering Contractors president **Norman Milne** believes that companies would be more willing to train people if there was a guaranteed stream of projects.

Outlook

While the South Africa's construction industry is expected to show restrained recovery in the short term, its outlook remains uncertain. Analysts warn that the sector remains greatly exposed as a result of its high level of reliance on government spend. The impact of ongoing labour unrest is expected to continue to limit construction activity, particularly in the mining sector, and in other sectors of the economy.

Participants forecast that South Africa's larger contractors will progressively pursue better margins outside South Africa's borders, where a growing number of large projects are breaking ground. In fact, with a number of African States already achieving notable economic growth rates, several analysts believe that the continent could prove to be the best investment for struggling South African contractors.

However, the construction industry continues to be a key sector in South Africa's economy. Analysts believe that if government is to make inroads into the backlog of projects in its portfolio, a proactive partnership with the construction sector needs to be developed.

ELECTRICITY

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South Africa's power system is extremely constrained and vulnerable, owing to decades of underinvestment in ageing power plants and delays in the completion of major new power stations. The power deficit has forced State-owned power utility Eskom to resort to rotational load-shedding, which Public Enterprises Minister **Lynne Brown** has warned will be instituted for two years.

Eskom has delayed critical maintenance over the past six years by relentlessly operating its generating fleet to meet demand ahead of the introduction of new capacity. The maintenance backlog caused plant availability to drop to about 65% last year. Since December 2014, the availability of plant performance has improved to about 70%, against a target of more than 80%, which Eskom aims to achieve in the next three years.

Plant breakdowns have resulted in a

higher number of unplanned outages and, as a result, the utility's reserve capacity, which is considered adequate at 2 000 MW, has decreased significantly.

The poor performance of the existing coal-fired generation fleet was given as one of the main reasons for the suspension of former Eskom CEO **Tshediso Matona** and three other senior executives in March this year. The Eskom senior executives were suspended pending the outcome of an inquiry into the status of Eskom and its challenges.

Zola Tsotsi, who ordered the investigation, resigned as chairperson on March 31, after concerns were raised about the procedure he had followed in appointing management consultant **Nick Linnell** to oversee the inquiry. Subsequent to Tsotsi's resignation, the Eskom board has agreed to new terms of reference for the investigation, which will focus on Eskom's finances and maintenance protocols, as well as diesel costs, and coal supply and costs. It also appointed global law firm Dentons to lead the inquiry.

Matona and Eskom have since mutually agreed to part ways on an amicable basis.

The suspension of the senior executives and the departure of the chairperson have thrown the Eskom leadership into a state of turmoil, which Brown stabilised in April with the appointment of Transnet CEO **Brian Molefe** as acting Eskom CEO for one year. Upon his appointment, Molefe stated that his immediate focus would be to improve the efficiency of the coal fleet and that his medium-term focus would be to introduce alternative energy sources into the coal-heavy electricity mix.

The board also appointed Dr **Ben Ngubane** as interim chairperson from March 31.

Eskom Financial Status and Tariffs

The operational crisis at Eskom is placing financial strain on the utility. Government has provided a R60-billion subordinated loan, which it supplemented with commitments to provide a further R23-billion in

Eskom maintenance interventions

Following an analysis of its generation assets, Eskom has broken the performance of its 121 producing units into four colour-coded categories: good (green), not so good (yellow), bad (orange) and very bad (red). Only 49 units are in the green, with 14 falling into the yellow category, 26 in the orange category and 32 in the red category.

The net result is that the energy availability factor (EAF) across the fleet has fallen from 90% in 2001, to about 70%, with unplanned breakdowns having surged to about 15% the 2014/15 summer.

To halt its maintenance backlog, Eskom is pursuing a three-year maintenance plan, which is focusing on halting the unplanned losses in 2015/16; stabilising the EAF in 2016/17; and shifting the balance between proactive and reactive maintenance from 2017/18 onwards.

The utility is facilitating the programme by operating and maintaining the generation assets to agreed

"availabilities, capacities, reliabilities and efficiencies". It involves 14 project interventions, ranging from deploying maintenance engineers from head office to the actual power stations to improving outage planning and management. However, the plan does not involve a major increase in the volume of planned maintenance, which has been increased from 7% to 10% instead of the 15% level initially envisaged. This is because Eskom's analysis indicates that it does not have the people, the parts and spares, the finances or the reserve margin to make such a step change.

Instead, its focus is on improving the quality of its maintenance through improving planning processes and project execution. The theory is that, once Eskom has reduced the capacity lost, it will have more space available for proactive maintenance, which will trigger a virtuous circle and shift in the balance in favour of proactive and preventative activities.



Picture by Chief Photographer Duane Davis

Source: Engineering News

funding, which will be paid in three instalments, with the first transfer to be made in June.

While the financial support will help to meet Eskom's short-term needs, the utility has long maintained that cost-reflective tariffs are imperative to secure its long-term health. Lower-than-requested tariff increases in the third multiyear price determination (MYPD3) period have left Eskom with a R225-billion revenue shortfall over the five-year period to 2018. Although Eskom had applied for yearly increases of 16% in 2013, the National Energy Regulator of South Africa (Nersa) granted an 8% yearly tariff increase for the MYPD3.

In May, Eskom applied to Nersa for the selective reopening of the final three years of the MYPD3 period. Should the application be approved, the 2015/16 increase will surge to 25.3%, inclusive of the 12.7% already granted for the current financial year. Eskom attributed 10.1% of the additional increase to the extra costs associated with the diesel it uses to operate the open-cycle gas turbine (OCGT) plants for extended periods, as well as the extension of short-term power purchase agreements with independent power producers (IPPs). The balance of the increase relates to the 2c/kWh environmental levy increase

announced in the 2015 Budget. Nersa will announce its decision on Eskom's application on June 29.

To improve its financial position, Eskom has proposed bypassing municipalities and installing prepaid electricity systems. Municipalities owe Eskom R25-billion, which Molefe says could have been part of the utility's working capital if electricity was prepaid. In April, Eskom indicated that it planned to disconnect supply to 20 defaulting municipalities that collectively owe Eskom about R4-billion. Cooperative Governance and Traditional Affairs Minister **Pravin Gordhan** has since said that the mayors of the affected municipalities have agreed that the debt should be settled. By early June, all but three of the top defaulting municipalities had settled their outstanding dues.

In light of Eskom's financial position and its inability to guarantee supply, support for privatising the State-owned power utility has been increasing. National Treasury has confirmed that it is considering the possibility of ringfencing and selling stakes in Eskom's noncore businesses or power stations, as well as Eskom's business as a whole. Strategic private-sector investment will provide immediate cash to strengthen Eskom's financial position and will enable

the utility to harness technical expertise to improve the performance of the power system. The State will retain control of the company.

Several groups, including opposition parties, such as the Democratic Alliance, have long advocated for Eskom's privatisation, while labour unions, which believe that privatisation is a threat to jobs, have said they will oppose any proposal to partially privatise the utility.

Eskom Capacity Expansion

Eskom's capacity expansion programme started in 2005 and will be completed in 2021, increasing generating capacity by 17 384 MW, transmission lines by 9 756 km and substation capacity to 42 470 MVA. To date, about 6 238 MW of new capacity has been added, and 5 814 km of transmission lines and 29 655 MVA of substation capacity have been installed.

Source: Eskom

The failure to keep Eskom's capacity expansion programme on schedule, particularly its three largest new build projects – the Medupi and Kusile coal-fired power stations and the Ingula pumped-storage scheme – has contributed significantly to the utility's operational woes.

The 4 764 MW Medupi power station, in Limpopo, is the most advanced of the three projects, although it has been characterised by numerous technical problems and labour disruptions since construction started in 2007. Eskom originally expected to synchronise Unit 6 – the first 794 MW unit of the plant – in 2011, but reached this milestone only on March 2. Once the other five units are completed, the power station will represent 12% of Eskom's installed capacity.

The 4 800 MW Kusile power station, in Mpumalanga, is adjacent to the existing Kendal power station. Like Medupi, the Kusile project is also much delayed. The completion of the first 800 MW unit was initially scheduled for mid-2013, but is now expected to be synchronised in the first half of 2017, entering commercial operations by the second half of that year.

The Ingula project is a 1 332 MW pumped-storage power scheme, straddling the border of the Free State and KwaZulu-Natal. The project suffered a major setback in 2013,



Picture by Chief Photographer Duane Davis

when a fatal accident halted work on the site for 12 months, delaying the commissioning of the first unit to the first half of 2016.

While the Medupi, Kusile and Ingula projects are behind schedule, the Sere wind farm, in the Western Cape, achieved its full generating capacity of 100 MW at the end of January – two months ahead of the targeted date of the end of March.

Independent Power Producers

South Africa's current electricity situation has placed a renewed focus on IPPs. By 2022, an additional 17 000 MW of IPP capacity will have been added to the national grid from renewable energy, cogeneration, coal and gas sources, with the Department of Energy (DoE) set to procure the capacity at a rate of 2 400 MW/y.

Since 2011, the DoE IPP Office has procured 5 243 MW of renewable energy from 79 projects in four bidding rounds of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). Of these projects, 37 have been connected to the national grid, representing 1 827 MW of capacity. By mid-2016, 47 projects should be operational and produce at full capacity.

The most recent bid round – window four – presented the IPP Office with 77 projects, 13 of which were selected as preferred bidders. The DoE plans to name additional preferred bidders under this bid window and will also allow unsuccessful bidders from previous rounds to bid for 1 800 MW of capacity.

Renewable-energy tariffs have improved significantly in the four bidding rounds. In April 2014 terms, the average per kilowatt hour tariff for onshore wind has declined by 55% to an average of 62c, while the solar photovoltaic tariff has declined by 76% to 79c. Prices for wind power in round four are understood to have fallen to an average of 62c/kWh, which is a market improvement on the prices of more than R1/MW achieved during the first bid window.

Some renewable-energy investors have warned that South Africa's prices are becoming "dangerously low" and have urged government to ensure that the REIPPPP sustains an appropriate balance between risk and reward. To maintain the momentum of the REIPPPP, which has facilitated

Window four preferred bidders

Technology	Number of bids	MW taken by preferred bidders	Maximum allocation for window
Solar photovoltaic	6	415 MW	400 MW
Onshore wind	5	676 MW	590 MW
Concentrated solar power	N/A	N/A	–
Small hydro (<40 MW)	1	5 MW	60 MW
Landfill gas	–	–	15 MW
Biomass	1	25 MW	40 MW
Biogas	N/A	N/A	–
Total	13	1 121 MW	1 105 MW

Source: Department of Energy, REIPPPP window four announcement

R170-billion in capital investment in South Africa, the DoE has submitted a determination to Nersa for an additional 6 300 MW of renewable-energy capacity.

A small project IPP programme is also under way, aiming to procure electricity from renewable-energy projects ranging from 1 MW to 5 MW. A total of 29 bids have been submitted, totalling 139 MW.

Grid connections have emerged as a major constraint and Eskom has confirmed that it is increasingly difficult and expensive to integrate IPP projects, with the easy-to-connect projects having been selected during the first two bid windows. Eskom has introduced a self-build policy and is encouraging IPPs to fund connections to the national grid themselves.

The IPP Office is redesigning the REIPPPP request for proposal (RFP) documents, which will take into account, among other aspects, the distribution and transmission system constraints.

Extending its IPP procurement reach beyond renewable energy, the DoE intends to procure electricity generated from gas, coal and cogeneration plants, as well as from hydroelectric sources in South Africa and sub-Saharan Africa. In line with Gazetted determinations, government will procure at least 800 MW of cogenerated capacity, 2 500 MW of coal-fired baseload capacity, 3 126 MW of natural gas capacity and 2 609 MW of domestic and hydro-electricity capacity.

However, the DoE has indicated that the cogeneration allocation could be adjusted upwards and has submitted a new determination for 1 800 MW of cogeneration to Nersa for concurrence.

The DoE issued a notice of a request for bids (RFB) for cogeneration capacity in

June. The IPP Office will consider combined heat and power generation projects, as well as waste-to-energy and industrial biomass developments. The RFB does not indicate an allocation between the technologies. It also does not stipulate a bidding closing date; however, Energy Minister **Tina Joemat-Pettersson** has indicated that the cogeneration bidding process will be pursued under a model aimed at expediting the approval process and financial close of projects.

The IPP Office is also overseeing the coal baseload IPP programme, which is targeting power stations with a maximum size of 600 MW a project. The RFP, under which 1 600 MW of capacity will be procured in the first bidding round, was issued in December 2014. The first coal IPP bid window was initially scheduled to close in June, but it was extended to the end of August. Preferred bidders will be announced before the end of this calendar year.

The DoE has further released a request for information (RFI) for gas-fired generation, the outcome of which will guide the design of a 3 126 MW gas-to-power procurement programme. The RFP for the programme should be released to the market in September, with a bid submission phase planned for the first quarter of 2016.

Demand-Side Initiatives

Eskom halted its demand-side management (DSM) expenditure in 2014/15, owing to funding uncertainty. The utility has since moved to restart the scheme, setting a savings target of 975 MW for the coming two years. The utility is aiming to achieve more than 500 MW of savings from incentivising

mining and industrial companies for projects that either reduce demand or shift consumption from peak periods. It will focus on a small number of large projects, rather than following the previous model that incentivised a large number of small projects.

Eskom will target savings of 455 MW through the mass replacement of household light bulbs with energy-saving bulbs.

It has set aside R1.7-billion for the implementation of the DSM programme and intends to spend about 90% of the budget in the current financial year and during 2016/17.

Meanwhile, South Africa is also pursuing a solar water heater (SWH) programme to reduce demand on the grid. The DoE took over the responsibility of implementing the programme from Eskom on February 1. The department aims to accelerate the installation of SWHs with a new rebate system, and subsidies for local content.

The DoE is also gathering information on the potential for demand reduction, load shifting and energy efficiency initiatives. In response to an RFI, the IPP Office received 150 responses, 27 of which are classified as immediate opportunities and 42 as medium-term opportunities. A procurement programme is expected to be launched during the second half of 2015.

Energy Planning

The Energy Minister said in May that government had accelerated the Integrated

Energy Plan (IEP), which would inform the future energy mix and prioritise policy interventions, but she did not give an indication of when Cabinet was likely to approve the plan. Cabinet approved a draft version of the IEP in July 2013.

It is understood that the IEP has to be completed before government will update the Integrated Resources Plan (IRP), which outlines the country's electricity requirements. The IRP is supposed to be updated every two years and was revised in 2013. However, Cabinet has not yet approved the update, which was published in December 2013, making the now-outdated policy-adjusted IRP, or IRP2010, still the framework informing investment decisions in the electricity sector.

The DoE is also finalising a Gas Utilisation Master Plan, which will guide gas-related infrastructure decision-making and will pave the way for the 3 126 MW envisaged gas-to-power procurement programme. The plan will be released for public comment in the July-to-September quarter.

A National Energy Efficiency Strategy and Action Plan is also being finalised. Draft regulations have been published for compulsory energy management plans to be put in place by targeted end-users.

Nuclear Procurement

The IRP2010, which remains the official policy document until it is replaced by a full iteration, recommends 9 600 MW of additional nuclear power. Joemat-Pettersson has

announced that the nuclear procurement process would start in the July-to-September quarter of 2015. The outcome of this process will be presented to Cabinet by the end of 2015. Government plans to connect the first nuclear unit to the grid by 2023.

Workshops have been completed with representatives of Canada, China, France, Japan, Russia, South Korea and the US, with nuclear vendors from those countries having shown an interest in participating in South Africa's nuclear new build programme.

The IRP update of 2013 recommended that additional nuclear capacity be delayed or abandoned.

Outlook

The power system will be constrained for the foreseeable future, while Eskom is dealing with a large maintenance backlog on its coal-fired generation fleet and is working towards adding new capacity from its three major baseload projects.

For 2015, there is a probability of load-shedding for 25% of the days in the year, or for over 90 out of 365 days. The risk is lower in winter when planned maintenance is reduced and the prospect of partial losses associated with high temperatures and wet coal falls.

New Eskom capacity, non-Eskom supply and DSM should bolster electricity supply in the medium term.

The utility's dispatchable installed capacity should increase to more than 45 000 MW, from 43 500 MW, next year, with the introduction of Medupi Unit 6 from July, the introduction of DoE peaker projects late in 2015 and the introduction of the first unit of the Ingula scheme in early 2016.

Eskom is also considering procuring hydropower from the Kariba dam, in Zambia, thereby exploiting renewable-energy sources and importing energy supply on power barges to introduce about 4 800 MW of capacity in two years. Turkish floating power plant group Karpowership has indicated that it is in a position to introduce about 500 MW of capacity into South Africa by the end of 2015 and as much as 2 000 MW within 18 months. The company claims that the powership solution could deliver a R43-billion saving when compared with the cost of operating OCGTs.

Not only will developments regarding Eskom's generation capacity be closely monitored but also progress regarding new electricity capacity from IPPs.



Picture by Bloomberg

ROAD & RAIL

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Road Infrastructure

South Africa's road network stretches some 750 000 km, making it the tenth-longest in the world. Of that, about 618 000 km are classified as proclaimed roads, of which about 3% are national, 45% provincial and 52% municipal.

The national roads, which are managed by the South African National Roads Agency Limited (Sanral), are considered to be in a good condition, but many of the provincial and municipal networks have been deteriorating over the past few decades, owing to insufficient funding. Sanral puts the estimated backlog for the development of South Africa's roads at about R197-billion.

Funding allocated by National Treasury to municipalities is generally used for the development of road infrastructure, with the expectation that the maintenance of these roads be funded from municipal revenues; however, the South African Local Government Association argues that, in some instances, there is no tax base to fund road maintenance and that a road infrastructure grant should be provided to municipalities for this purpose.

Meanwhile, a Provincial Road Maintenance Grant was established by government to upgrade those portions of the provincial road network that are in a poor or very poor condition. More than R30-billion will be spent in the medium-term expenditure framework period to 2017/18 for the maintenance and rehabilitation of provincial roads that are mainly the responsibility of the various provincial transport departments, except for Limpopo, where a dedicated roads agency manages the network.

To further assist in the upgrading of the country's road network, Sanral is also being tasked with taking over responsibility for improving certain strategic provincial roads that are in a poor or very poor condition.

Funding National Road Infrastructure

Sanral's national road network, which is expected to eventually increase to 35 000 km, currently stretches some 21 403 km. Treasury has allocated about R12.5-billion to Sanral to fund improvements and maintenance on its national nontoll roads, which represent about 85% of its overall network, in the 2015/16 financial year. This compares with the R10.5-billion allocated to the agency in the prior financial year.

The remaining 15% of Sanral's network comprises 3 120 km of toll roads, which are self-funded, by the agency and through three private-sector concessionaires that manage about 1 290 km of national roads on behalf of the agency. No cross-subsidisation is allowed and the agency is, therefore, unable to use the funds allocated by Treasury to fund developments or maintenance on its tolled network. In 2013/14, Sanral's toll portfolio generated R3.5-billion in funding, a 65.7% year-on-year increase.

Sanral also raises funding for the maintenance and expansion of the 1 832 km of the toll road network that it manages directly on the capital markets. It incurred about R20-billion of debt to undertake the first phase of the Gauteng Freeway Improvement Project (GFIP), on which work started in 2007. The agency decided to adopt the user-pays principle through electronic tolling, or e-tolling, to generate the required funds to repay that debt, but continues to face challenges in this regard, leading to uncertainty over its ability to repay that debt.

Following complaints about the high cost of e-tolls, the tolls fees were reduced and e-tolls were officially implemented as from December 2013; however, many road users in the province have refused to pay the toll fees since their inception, while others have since stopped paying e-tolls and deregistered their e-toll accounts. By August 2014, unpaid e-toll bills were nearing the R1-billion mark and Sanral revealed in February that it had only collected about

62% of its forecast e-toll revenue for the financial year, leaving the agency with a R588-million e-toll shortfall. Only about 262 000 key account holders, or about 22% of registered GFIP road users, were said to be regularly paying their e-tolls by April.

Sanral has, therefore, resorted to funding the GFIP repayments from debt and, in 2014, started holding monthly bond auctions. The first three auctions, held in April, May and June 2014, each raised R500-million, as expected. However, Gauteng Premier **David Makhura** announced in July 2014 that the province would initiate a process to assess the socioeconomic impact of e-tolls. The uncertainty created by this process, even after the assessment had been completed, has led to less successful bond auctions for Sanral, with its April auction raising only R270-million of the R600-million the agency wanted to raise. This prompted Sanral, in May, to cancel further bond auctions.

A 15-member panel established by Makhura held several hearings in August 2014, with submissions made by business, other organisations, Sanral and Transport Minister **Dipuo Peters**, besides others. Several organisations argued that a fuel levy should be implemented to cover the costs of repaying the GFIP debt, but Sanral CEO **Nazir Alli** and Peters strongly opposed this. Alli told the panel that an additional 16c/ℓ would have to be added to the fuel levy to pay for the GFIP in lieu of the e-tolls and a further R1/ℓ addition to the levy would be required to cover the R65.8-billion in costs to maintain the national road network.

He and Peters argued that increasing the fuel levy to cover the costs of upgrading the road network in Gauteng would be unfair towards citizens in the rest of the country who did not use those roads.

After concluding the hearings, the panel delivered a report to Makhura at the end of 2014, in which it made several recommendations. The panel felt the e-toll system was administratively cumbersome and that it placed a disproportionate financial burden on low- and middle-income households, but the system was also found to benefit the

provincial economy and residents through reduced travelling time, improved fuel efficiency and improved logistics.

Of the more than 50 recommendations contained in the report that was submitted to Makhura, a key element was the proposal of a hybrid funding model incorporating various revenue streams, including funding from the provincial fiscus, reducing the cap on e-tolls, ringfencing a national fuel levy and recovering funds from the construction industry for the construction of the GFIP roads, to finance debt incurred for Phase 1 of the GFIP and to raise the funding needed for phases 2 and 3.

After many months of waiting, government, in May, provided Gauteng residents with an outcome following the work of the panel. Although many had been hopeful that e-tolls in the province would be scrapped, government instead opted for a hybrid funding model. Deputy President **Cyril Ramaphosa** announced late in May that Sanral would, in phases over the coming months, implement a standard tariff of 30c/km and a monthly cap of R225 for all users – whether they had an e-tag or not – compared with the current 58c/km and R450 cap subject to possession of an e-tag.

The reduced tariffs would result in a yearly revenue shortfall of R390-million for Sanral, which would be shared between the national government and the Gauteng provincial government.

Meanwhile, to incentivise road users to pay their outstanding e-toll bills, users would receive a 60% discount on outstanding fees, provided this was paid within six months.

To ensure even greater compliance, government plans to introduce amendments to the Administrative Adjudication of Road Traffic Offences Act to make the renewal of motor vehicle licences dependent on whether a user's e-toll fees were paid.

Key Road Projects

Peters stressed during a media briefing prior to her Budget Vote in May that the Department of Transport (DoT) was prioritising the expansion of the country's road network, given that the number of vehicles on South Africa's roads have increased from five-million in 1994 to more than 11-million in 2014.

In addition to various smaller road upgrade projects being undertaken by Sanral, as well as provincial and municipal entities, the roads agency also has several large multi-

billion-rand projects in the pipeline, including the proposed N1/N2 Winelands project and the N2 Wild Coast road – both of which have been dogged by controversy.

A record of decision for the proposed N1/N2 Winelands project was first issued for the in 2005, but its implementation has been delayed amid an ongoing court battle between Sanral and the City of Cape Town. The city is heavily opposed to the project and, in November 2013, initiated a court bid to have certain documents related to the project made public. Sanral had wanted to keep the information confidential.

After various court appeals, the city was in March 2015 granted permission by the Supreme Court of Appeal to disclose details of the tender. Following the ruling, the city said the proposed tariffs for the project were 84.95c/km and that the concessionaire would earn R48-billion in toll revenue over the concession period. It stated that the high toll tariffs would outweigh any benefits for road users and that the high costs would negatively affect the transportation of agricultural goods.

Alli, however, refuted the claims, stating that the toll tariffs for the project had not yet been set, as this could only be done by the Transport Minister.

The Western Cape High Court will, in August, hear an application by the city to have Sanral's decision to implement tolling along these routes reviewed.

The national roads agency is also facing opposition to the implementation of its proposed N2 Wild Coast toll project. It was initially planned to stretch from East London, in the Eastern Cape, to Durban, in KwaZulu-Natal, but following strong opposition, Sanral decided to develop the road infrastructure only in the Eastern Cape. In March, there were allegations that the roads agency had fraudulently filed affidavits from Wild Coast residents expressing support for the project. Sanral is investigating the allegations.

Another significant proposed road project is the R5.3-billion De Beers Expressway, which will be built and operated by an existing Sanral concessionaire – N3 Toll Concession – and which will entail the construction of a 99 km dual carriageway from Keefersfontein, in KwaZulu-Natal, to Warden, in the Free State.

Public Transport by Road

Taxis are the main mode of transport for nearly 70% of all households in South Africa,

transporting about 15-million commuters a day; however, safety and reliability are two of the biggest concerns for commuters. The DoT plans to review the taxi recapitalisation programme, which was introduced in 2006 to renew the country's ageing fleet of taxis and improve the safety of this mode of transport. The programme is, however, regarded by many as having been a failure, as it has not achieved the desired outcome.

Meanwhile, a number of cities in South Africa are rolling out bus rapid transit (BRT) or integrated rapid public transport network (IRPTN) systems. Four BRT systems – the Rea Vaya, in Johannesburg; MyCiTi, in Cape Town; A Re Yeng, in Tshwane; and Yarona, in Rustenburg – have gotten off the ground.

Public Transport

President **Jacob Zuma** noted in his February State of the Nation address that R6-billion would be spent on the planning and implementation of integrated public transport networks in 13 cities in the 2016 financial year.

Source: Engineering News

While the development of BRT systems and IRPTNs is good news for some commuters, traditional bus operating companies, such as Putco and Metrobus, have revealed that their businesses are struggling financially owing to government funding increasingly being directed towards BRT systems and IRPTNs and away from traditional bus services. Putco has decided not to renew contracts on three loss-making routes in Gauteng, while Metrobus has asked the City of Johannesburg to pay its subsidy on the basis of the number of passengers transported or kilometres travelled, rather than through a yearly grant of about R300-million. Metrobus too was planning to halt operations on routes that compete with the Rea Vaya system.

Road Freight

More than 80% of all freight in South Africa continues to be transported by road rather than rail, despite government and private-sector efforts to move more rail-friendly freight back onto the rail system to reduce logistics costs, reduce damage to the country's road network, reduce congestion, improve safety on the country's roads and improve South Africa's competitiveness.

As part of efforts to achieve these objectives, State-owned freight logistics group Transnet is investing heavily to improve its

infrastructure and service; however, logistics service providers, road hauliers and other private-sector companies are encouraged to also contribute to ensuring the integration of road and rail logistics solutions, as this is likely to be less costly than making use of either mode on its own.

Rail Freight

Transnet, in 2012, embarked on its R300-billion seven-year Market Demand Strategy to improve its rail, port and pipeline infrastructure. The countercyclical investment programme is aimed at creating capacity ahead of demand. The lion's share of the investment – about R200-billion – is focused on improving and expanding the entity's ageing rail infrastructure to grow volumes from 200-million to about 344-million tons by 2021. Transnet Freight Rail (TFR), which is responsible for the group's rail operations, is undertaking a number of key expansion projects.

TFR will invest about R45.5-billion on expanding capacity on its coal export line, which runs from the Mpumalanga coalfields to the Richards Bay Coal Terminal (RBCT), to 97.5-million tons in 2021. Coal rail volumes have for some time been unable to keep up with capacity expansions at the RBCT, which has capacity to export 91-million tons a year of coal and which could potentially be further expanded to 110-million tons a year.

TFR and Swaziland Railways are collaborating on the proposed SwaziLink project – a 146 km railway line between Lothair, Mpumalanga, and Sidvokodvo, Swaziland, which will enable TFR to divert the transportation of general freight from the coal export rail line through Swaziland instead. This could potentially increase the coal export rail line's capacity to 120-million tons a year. TFR plans to make an investment decision on the proposed project by August.

Further, TFR is also investigating options for the development of a 560 km Waterberg heavy-haul rail line to link the Waterberg coalfield, in Limpopo, to the existing export coal rail line. A feasibility study on the proposed project is due for completion in August.

Meanwhile, the capacity on the 861 km heavy-haul iron-ore export rail line, between Sishen, in the Northern Cape, and the Port of Saldanha Bay, in the Western Cape, will be expanded to 70-million tons by 2021.

In addition, TFR is working to establish its third heavy-haul export rail line, which

will increase the volume of manganese ore transported from mines in the Northern Cape to the Port of Ngqura, in the Eastern Cape, to 16-million tons a year. It is, therefore, upgrading the Postmasburg–Port Elizabeth/Ngqura rail line.

TFR's General Freight Business (GFB), which transports various commodities, products and minerals, as well as containers, increased its rail volumes to 87.9-million tons in the 2014 financial year, compared with 82.6-million the year before. GFB rail volumes were, however, below the 91.22-million tons targeted for the 2014 financial year. Some of the additional capacity being created will be through the proposed SwaziLink project.

The expansion of the GFB will also require significant investment in new rolling stock. TFR will procure 1 064 locomotives – 599 electric and 465 diesel – for its GFB unit by February 2018 and has awarded tenders, worth a collective R50-billion, to consortiums led by General Electric (GE), China North Rail, China South Rail (CSR) and Bombardier Transportation.

The contracts have strict local content requirements of 40% each, with the majority of the locomotives to be produced at Transnet Rail Engineering's (TRE's) Koedoespoort and Durban facilities. To fund the procurement of locomotives from the consortiums led by GE and Bombardier, Transnet, in March, secured funding agreements, worth a collective R13-billion, with the Export–Import Bank of the US and Canadian export credit agency Export Development Canada.

In April, TFR took delivery of 95 Class 20E locomotives from CSR Zhuzhou Electric Locomotive, which in 2012, secured a R3-billion contract to build the locomotives. Ten of the locomotives were built at CSR's facilities in China and the remainder assembled at TRE's Koedoespoort facility. TFR is also procuring 60 Class 43 diesel locomotives from GE.

Passenger Rail

The Passenger Rail Agency of South Africa (PRASA) is mainly responsible for commuter rail services in South Africa. Its Metrorail services form the bulk of its commuter rail operations, transporting more than two-million people to and from work every weekday and making an estimated 500-million passenger trips a year. Metrorail has a fleet of about 270 train sets, or about 3 100 passenger coaches.

PRASA also provides intercity rail services

between some of the larger cities in the country through its Shosholoza Meyl and Premier Class operations. The number of passengers using these services has, however, declined significantly from more than three-million in 2009/10 to 900 000 in 2013/14, leading to a R700-million loss for the rail agency. At the same time, the number of operational trains available for these services has halved to 3 000 a year, compared with 6 000 a year in 2009/10.

Following many years of underinvestment, the rail agency has embarked on a 20-year rolling stock fleet renewal programme to replace ageing trains, which are, on average, more than 40 years old and to expand its available rolling stock. PRASA will invest R123-billion, over two phases, to acquire about 7 200 new rail vehicles by 2034. The Gibela Rail Transportation consortium, comprising French multinational Alstom and a number of South African partners, has been awarded a R51-billion contract to supply the first 600 trains – Alstom's X'Trapolis Mega trains – for PRASA's Metrorail service by 2025.

The first 20 trains are being manufactured in São Paulo, Brazil, while a local manufacturing facility to be built in Dunnotar, Ekurhuleni, will produce the remainder of the trains at a rate of 62 a year once in full operation. The first locally assembled train will be produced in June 2017. The consortium is striving for a 70% localisation target for all trains.

In addition to rolling stock upgrades, PRASA is also investing in upgrades to its signalling networks and train stations, the extension of existing rail lines and modernising its rail depots.

Meanwhile, ridership numbers on the 80 km Gautrain rapid-rail system, in Gauteng, have remained well below the targeted 110 000 passengers a month, with about 55 000 passengers having used the service per weekday in January. The Gautrain Management Agency (GMA) has attributed the low ridership numbers to uncertainty about the implementation of e-tolls on the GFIP; however, commuters have also been faced with unplanned strikes by bus drivers, interruptions in services owing to electricity cable theft and rail under-capacity at peak times. Rail fares have also increased by between 4% and 6%, and parking fees by R1, as from June 1.

The GMA is considering expanding the Gautrain system along four proposed routes. A feasibility study on the proposed expansion is expected to be concluded by January 2016.

STEEL

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The South African Market

South Africa's steel sector is a significant contributor to the country's economy and a significant foreign exchange earner through its exports to other African countries.

According to worldsteel production data for 2014, South Africa was the biggest steel producer in Africa and the twenty-second largest steel producer in the world, having produced 7.253-million tonnes of steel.

Nonetheless, the domestic market remained extremely challenging in 2014. Apparent steel consumption decreased by 9.31% and real steel consumption by 3.1%, according to South Africa's biggest steel producer ArcelorMittal South Africa (AMSA).

Infrastructural spend was negligible and overall economic activity was static ahead of the national elections, held in May 2014, with gross domestic product (GDP) growth for the year amounting to just 1.4%.

Challenges

The steel sector, as with other manufacturing sectors, is also struggling with the impacts of industrial action.

Demand for steel in the domestic market was negatively impacted on by a five-month strike by employees in South Africa's platinum mining sector, which ended in May 2014. This was followed by a month-long strike by members of the National Union of Metalworkers of South Africa and other smaller trade unions in the metals and engineering sector in July 2014.

In addition, electricity supply issues and increasing amounts of imports have become significant challenges for the steel sector. Steel and Engineering Industries Federation of Southern Africa chief economist **Henk Langenhoven** has warned that electricity power cuts, or load-shedding, has the potential to "wipe out up to 23% of production" in the metals and engineering

sector. The industry body noted in December 2014 that an estimated R6-billion in manufacturing output and about R1.5-billion in value addition had been lost in the metals and engineering sector alone, owing to the power cuts.

Supply and Demand

Worldsteel's Steel Statistical Yearbook 2014, released in November of that same year, showed that South Africa's imports of semifinished and finished steel products had increased from 432 000 t in 2003 to just under 1.76-million tonnes in 2013. This was partly as a result of the slowdown in Chinese demand for steel products, which resulted in a heightened export focus by producers in that country on South Africa and other emerging markets. The result was a flood of Chinese State-subsidised flat and long products into a contracting domestic market.

Such was the impact of subsidised Chinese imports that, in November 2014, AMSA formally applied for the imposition of import duties on Chinese flat and long steel products to effect a measure of protection similar to that sanctioned by governments of other developing markets including Turkey, Egypt and Brazil. AMSA has estimated that imports comprised 40% of all steel consumed in South Africa during February.

Domestic steel demand has, perhaps most tellingly, also stagnated in recent years amid slow economic growth and slow progress in the roll-out of the country's R847-billion public-sector infrastructure development plans.

Despite this, government is confident of an upturn in domestic demand for steel in the next decade, with Trade and Industry Deputy Minister **Mzwandile Masina** having told delegates at a December 2014 Organisation for Economic Cooperation and Development/South Africa Workshop on Steelmaking Raw Materials, held in South Africa, that implementation of the National Development Plan (NDP) would

lead to higher demand for steel. He outlined that upstream and downstream steel demand would grow by between 6% and 10% to 2024, mainly owing to government implementing 18 strategic infrastructure projects – consisting of more than 600 component projects outlined in the National Infrastructure Plan – covering the rail, energy, education and water and sanitation sectors, besides others.

The NDP envisages increasing capital expenditure to 30% of GDP by 2030, from the current 17%, as well as increasing public infrastructure spend to 10% of GDP.

AMSA argues that, to achieve the NDP growth objectives, South Africa will need to increase domestic steel supply by 8.3-million tonnes a year, much of which can be delivered by local producers.

Based on its mid-2014 production levels, AMSA says it has 2.3-million tonnes of reserve capacity to meet nearly 27% of the projected additional demand.

However, the steel producer, which recently completed the R2-billion reline of the blast furnace at the Newcastle mill, in KwaZulu-Natal, has decided not to immediately ramp up the plant to its expanded 1.9-million-ton-a-year nameplate capacity, owing to weak domestic-market conditions.

AMSA CEO **Paul O'Flaherty** describes the South African steel market as being under "severe pressure", noting that, in the absence of import protection, the domestic market is currently heavily exposed to cheap imports, especially from China.

As a result, the group has decided to maintain Newcastle's daily output at 4 300 t instead of operating it at its 5 200 t daily potential.

O'Flaherty has said that the investment is "an investment in the future", which has been pursued despite the difficult economic circumstances in South Africa. He argues, however, that in the absence of private investment in infrastructure and the weak mining and manufacturing climate, government needs to do more to raise infrastructure spending as outlined in the NDP and detailed in the National Infrastructure Plan.

More Capacity

Plans are under way, however, to establish a third large-scale steel producer. In September 2014, the Industrial Development Corporation (IDC) and Chinese steel producer Hebei Iron and Steel signed a memorandum of understanding for the development of a two-phase \$4.5-billion steel mill development project, in South Africa's Limpopo province. Hebei will own a 51% stake in the mill, on which construction is expected to start this year.

Given the current oversupply in local steel production, the new steel mill is reportedly being built to supply not only the South African market but also the rest of sub-Saharan Africa, where steel demand is expected to increase to 31-million tons by 2020. Government is also hoping that the entrance of this latest steel producer will drive competition in the local market and result in producers charging lower prices.

Developmental Steel Price

Government continues to pursue the implementation of a developmental

steel price, which it contends will enable downstream customers that use locally produced steel to benefit from competitively priced raw materials. Trade and Industry Minister Dr **Rob Davies** and Economic Development Minister **Ebrahim Patel** are dissatisfied with the manner in which steel prices are being determined in the local market and have indicated that they might use the Competition Act to achieve government's goal of setting steel prices.

Government and industry do not agree with regard to the proposed developmental steel price, with the Department of Trade and Industry (DTI) countering that offering discounted prices for key inputs like steel to the local manufacturing sector will improve the country's competitive advantage and help it secure more foreign direct investment for key local manufacturing sectors.

Government also maintains that AMSA is charging excessive prices to domestic customers.

AMSA, however, argues that steel prices must be competitive and O'Flaherty has said that he will host bilateral work-

ing groups with the DTI, the Department of Economic Development, the IDC and the Competition Commission during 2015 to discuss various issues, including steel pricing.

Outlook

Worldsteel forecasts that global apparent steel use will increase by 0.5% to 1.54-billion tonnes in 2015, following growth of 0.6% in 2014. Meanwhile, world steel demand in 2016 is expected to increase by 1.4%, reaching an estimated 1.57-million tonnes.

China is still the biggest producer and consumer of steel and, as a result, its moderating economic growth rate is expected to have an impact on South Africa's and the global steel sector.

Chinese steel use will continue to record negative growth of -0.5% in 2015 and 2016.

Steel demand in the developed economies will increase by 0.2% in 2015 and by 1.8% in 2016, while demand in developing countries is expected to increase by 4% in 2016 after growing by 2.4% in 2015.



Picture by Chief Photographer Duane Davis

WATER

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For four years, the World Economic Forum's yearly global risk reports have cited water as one of the most important global challenges. This year, for the first time, water has moved to the top as the greatest risk facing the world. Water is now considered a bigger global risk than inter-State conflict, the failure to adapt to climate change and chronic unemployment.

In South Africa, concern is also growing about water scarcity and the related risks. About 90% of the 58 JSE Top-100 companies participating in the 2014 Carbon Disclosure Project's 'South Africa Water Report' have indicated that their direct operations are exposed to water risks and 55% believe that these risks will materialise in the next three years. When advisory firm Grant Thornton questioned 100 business executives about their outlook for South Africa for 2015, 68% indicated that they were affected by poor government service delivery and that the greatest issue was that of basic utility services, including water and electricity supply. In the first quarter of 2015, 83% of those surveyed indicated that utilities had negatively affected their businesses.

Ranked among the world's 30 driest countries, South Africa is fast approaching full utilisation of available surface water yields. However, despite being a water-stressed country, demand is rapidly increasing owing to population growth and urbanisation, while resource depletion, contamination and inefficient infrastructure are putting resources under strain. The country uses 235 ℓ a person a day, which is significantly more than the world average of 173 ℓ a person a day.

Against a backdrop of low supply and high demand, coupled with the poor use of existing resources, there have been many warnings that water could become as much of a limitation on economic growth as electricity – a shortage of which has had a severe impact on the country's economy in recent years. In 2014, analysts flagged water as a threat to new investment when South Africa's most popu-

lous province and economic hub, Gauteng, experienced weeks of water shortages.

Government has acknowledged the potential human development and economic consequences of water shortages in strategy and policy documents, such as the National Development Plan (NDP) and the second National Water Resources Strategy (NWRS-2); however, there are questions about whether policy interventions currently proposed are sufficient to ensure a water secure future.

The Institute of Security Studies (ISS) warned in a 2014 paper, 'Parched Prospects: The Emerging Water Crisis in South Africa', that policies presented in the NWRS-2 were not sufficient to address the water constraints facing South Africa. The ISS estimates a supply and demand gap of more than 3.5 km³ by 2030, which will reduce to 3.2 km³ by 2035. The paper's authors note that, even if policies to close the demand-supply gap by 2035 are implemented now, South Africa will still be overexploiting its water resources for the next 20 years, increasing the country's vulnerability to water shocks such as droughts.

Industry commentators have warned that, should the country experience a severe drought, it will only take two years before severe water restrictions will have to be implemented. This will affect coal-fired power stations, irrigation schemes and mines, among others.

Water Planning and Regulation

The three water-related policies governing South Africa's water sector are the White Paper on a National Water Policy for South Africa, adopted in 1997; the Strategic Framework for Water Services, adopted in 2003; and the NWRS, first adopted in 2004.

The NWRS-2 follows the NWRS-1 of 2004 and gazetted in August 2013. The policy defines the strategic direction for water resources management over the next 20 years, with emphasis on the priorities and objectives for 2013 to 2017. The NWRS-2 is aligned with the NDP and the National Water Act, which

requires the NWRS to be reviewed every five years. However, the trend is to develop ten-year strategies and the Department of Water and Sanitation (DWS) has indicated that it is considering progressing towards a ten-year window for the NWRS.

The DWS is reviewing the National Water Act and the National Water Services Act and may consolidate the two pieces of legislation into one to govern the entire water value chain. DWS has indicated that it plans to submit the National Water and Sanitation Bill to Parliament by March 2018. Sanitation is currently governed by the Strategic Framework on Water Services and the Water Services Act and not mandated by the National Water Act.

The DWS has completed the National Water Amendment Act 27 of 2014 process, which streamlined legislation with those of the departments of mineral resources and environmental affairs to create regulatory certainty on water-use authorisation.

Water Infrastructure

The provision of new infrastructure and, crucially, the management, operation and maintenance of existing infrastructure continue to be a challenge to providing sustainable water supply. Cabinet has set a goal of 90% reliable water services by 2019 – a target which requires a major infrastructure commitment.

The importance of water infrastructure is reflected in the Presidential Infrastructure Coordinating Commission's (PICC's) inclusion of water and sanitation among its 18 strategic infrastructure projects. The PICC, which President Jacob Zuma established in 2012 to accelerate infrastructure delivery, has indicated that it aims to pursue a major dam-building programme to increase access to water. The Clanwilliam dam, in the Western Cape; the Nwamitwa and Tzaneen dams, in Limpopo; the Hazelmere dam, in KwaZulu-Natal; and the Polihali dam, in Lesotho, will be upgraded and expanded, while new dams will be built on the Mzimvubu river, in the Eastern Cape.

Launched in 2014, the Mzimvubu water

resources development project entails the construction of two dams, one of which will be used for hydropower generation. Preliminary estimates indicate that the project will cost R20-billion and will include the construction of a dam at the Ntabelanga site, the Laleni hydropower scheme, bulk water infrastructure, infield irrigation infrastructure, access roads and the costs of land acquisition and catchment rehabilitation.

Other major infrastructure development projects at different stages of planning and construction include Phase 2 of the Lesotho Highlands Water Project (LHWP), between Lesotho and South Africa, as well as the Mokolo-Crocodile Water Augmentation Project (MCWAP) and the Mopani Emergency Works, both in Limpopo.

The 17.5-billion LHWP Phase 2 involves a water delivery system to augment supply to Gauteng and the Free State, as well as a hydropower generation system. Work started in December 2014 and the scheme is expected to start delivering water to South Africa in 2023. The Lesotho Highlands Development Authority in February issued three tenders for construction upgrading, geotechnical investigation works and resettlement planning services related to the project.

The R13.4-billion MCWAP was initially expected to start operating in September 2013, but severe flooding in the project area in 2014 and slow pipe-laying progress, owing to contractor and labour issues, had delayed the completion of the project to October 2015. The MCWAP system will run parallel to and join the existing infrastructure that supplies water to the Lephalale local municipality, Eskom's Matimba power station, the Zeeland power plant and Exxarro's Grootegeluk mine. It will also supply water to power utility Eskom's new Medupi power station.

Regarding water infrastructure maintenance, the DWS has stated that 44 dams will be fully rehabilitated by the end of the 2015/16 financial year under the Dam Safety Rehabilitation Programme.

Meanwhile, PICC has highlighted the importance of investment in pipelines to address the current disconnect between large water resources and communities. The separation of functions between the different spheres of government often result in national government completing dams, but communities failing to benefit from them, owing to delays in the installation of water reticulation systems. One such example is the R3.5-billion De Hoop dam, in Limpopo, where district

municipalities are experiencing challenges in connecting the required pipelines for communities to access water from the new dam.

Nonrevenue Water

Government loses an estimated R7.2-billion every year because of nonrevenue water – a term that refers to the water that is lost through physical leakage or commercial losses (such as meter under-registration, billing errors and theft), as well as unbilled authorised consumption (such as firefighting and mains flushing). The Water Research Commission (WRC) estimates that the current volume of nonrevenue water is about 1 580-million cubic metres a year, which is equal to the yearly supply of Africa's largest water utility, Rand Water.

According to a 2012 report by the WRC, 36.8% of the total municipal water supplied in South Africa is lost before it reaches municipal customers. The report found that nonrevenue water was the product of many factors, including poor planning, limited financial resources to implement programmes, poor infrastructure asset management and lack of capacity. Of the nonrevenue water losses, 25.4% was considered to be lost through physical leakage. While South Africa compares well with the world average of 36.6%, it does not compare well to other developed water-scarce countries, such as Australia, which has a nonrevenue water level of less than 10%.

To stem the tide of water losses, the DWS is spearheading a War on Leaks project, which compels municipalities and communities to report and fix water leaks, and introduced the No Drop assessment programme, which is run parallel to the Blue Drop water quality programme. The No Drop programme aims to reduce water losses to 18% by 2025.

President **Jacob Zuma** also announced in his 2015 State of the Nation address in February that 15 000 artisans and plumbers would be trained to fix taps and better maintain infrastructure. The artisans and plumbers will be trained at public technical and vocational education and training colleges based in municipalities with high water losses and nonrevenue water. The DWS has budgeted R650-million for the training of artisans and plumbers in the 2015/16 financial year.

The DWS is also considering legislating a minimum spend on maintenance to ensure that municipalities maintain existing infrastructure. Water and Sanitation Minister **Nomvula Mokonyane** indicated in May

that municipalities had to spend at least 15% of their budgets on maintenance.

Further, the Strategic Water Partners Network – a government and business partnership bringing together representatives from the DWS and private-sector companies – in 2015 launched a set of performance-based contracts to allow municipalities to contract practitioners to reduce water losses and be paid from the savings.

Water Quality

The quality of South Africa's freshwater resources is decreasing, owing to more pollution and the destruction of water catchments. The Water and Sanitation Minister has said that discharges from wastewater treatment works are considered the greatest threat to water quality. In response to the threat, government introduced the Green Drop certification scheme to measure the extent of municipal noncompliance to effluent standards in 2018.

The latest available Green Drop report is that of the 2012/13 assessment, which assessed 824 wastewater systems and indicates an improvement in the average performance of municipalities on wastewater management. The national Green Drop score increased from 71% in 2011 to 73.8% in 2013. In 2013, 415 wastewater systems obtained Green Drop scores of more than 50%, compared with 216 systems in 2009. Sixty wastewater systems were awarded Green Drop status, compared with 40 systems in 2011.

In terms of the quality of drinking water, the latest available assessment is the 2013 Blue Drop Progress report, which introduced a Blue Drop risk rating tool to identify, quantify and manage risks associated with drinking water services. The rating is meant to act as a precautionary tool to warn water service institutions about the level of risk at which water services and water quality is delivered. Covering 1 009 water supply systems, the 2013 assessment found that Gauteng had the highest percentage of low-risk systems and the North West the highest percentage of systems in the critical-risk category. The Western Cape, Eastern Cape and KwaZulu-Natal are the three provinces with the next most number of supply systems characterised with good drinking water quality management systems in place. The assessment indicated that of all the systems assessed, 146 systems (15%) showed a significant reduction in their Blue Drop risk rating score since the

2012 assessment. The Western Cape recorded the most systems (44) and the Free State the least systems (2) with significant improvement in risk ratings.

Civil rights organisation AfriForum has launched its own blue and green drop project to test the quality of potable and treated water in the municipalities throughout South Africa where its branches are situated. The campaign tested the quality of drinking and sewage water in 132 towns in March this year, and showed a marked improvement in water-quality management. Five out of 132 municipalities did not comply with the quality standards for drinking water, compared with 11 out of 107 drinking water systems that were not up to standard in 2014. AfriForum also tested 58 sewage water systems, of which 26 did not comply with quality standards.

Mining activity has resulted in significant water quality challenges, with acid mine drainage (AMD) considered one of the country's greatest environmental challenges. AMD, which refers to the flow, or seepage, of polluted water from mined-out areas, has become well publicised in recent years. In November 2014, the DWS announced it had set aside R10-billion to mitigate AMD in the Witwatersrand goldfields. The Western and

Central basins already have operational AMD treatment plants and work is under way on a similar plant in the Eastern basin. State-owned entity Trans-Caledon Tunnel Authority is implementing an AMD reuse project, in Gauteng, which involves the treatment of AMD and its sale to industry for reuse.

The DWS has also announced plans to establish an AMD or Mine Water Unit to ensure integrated and composite approaches for AMD and mine water management.

Further, a WRC-funded study is under way to develop the South African Mine Water Atlas, to provide water managers and policy makers with a comprehensive reference on the extent of mine-influenced water on the surface and underground. The atlas will be published in 2016.

Prospects

Government and experts agree that changes are required to ensure South Africa has a water secure future, but concede that there is no magic-bullet solution to fix what is considered a complex problem.

Conserving water and reducing demand is a key message from government and industry

commentators alike, considering that nearly half of urban water is wasted. The importance of reducing water losses has long been recognised by national government and was again highlighted in February, when Zuma announced plans to train 15 000 plumbers to fix leaking pipes and taps in municipalities. Some of the DWS's solutions to conserve water and better manage demand are to move sanitation systems from water-borne sewerage to low-water and no-water solutions; shifting from a system of highly centralised, expensive wastewater treatment dominance to one that has a combination of centralised and localised waste treatment; and moving away from high-energy waste treatment and technologies to low-energy and energy-producing waste treatment systems.

There is also a strong focus on improving South Africa's water mix by increasing the use of water sources other than surface water. These include a greater reliance on groundwater, rainwater harvesting, reusing municipal and industrial waste water, the reuse of treated AMD and desalination. It is estimated that municipal water demand could be reduced by about 30% if industrial, commercial and residential sectors adopted rainwater harvesting nationwide.



Picture by Chief Photographer Duane Davis

MINING INDEX

Coal



Picture by Chief Photographer Duane Davis

Gold



Picture by Chief Photographer Duane Davis

Iron-Ore



Picture by Chief Photographer Duane Davis

Platinum



Picture by Anglo American Platinum

COAL

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Coal Market

The past few years have been challenging for the global coal industry. It has shown significant financial underperformance since 2011, with the dramatic decline in prices for thermal and metallurgical coal the most arresting aspect.

Thermal Coal

For several years, the aim of coal producers was to expand production. New capacity was continuously being added, with demand led by China, which consumed every surplus tonne. However, since 2011, an oversupply of coal and low prices have dominated.

Coal prices have halved over the past few years as a result of rising output from exporters, including Australia, Indonesia, South Africa, Colombia and the US, and sluggish demand from industrialised and emerging markets.

The global market for seaborne thermal coal, or hard coal, which is used mainly to generate power, was expected to be oversupplied by an estimated ten-million tonnes in 2014, keeping prices below profitable levels for most coal producers and forcing some mines to close. Some producers locked into infrastructure supply services have increased

production to lower unit costs, which might have deferred the decision to reduce capacity or close down operations.

While exact numbers are difficult to obtain, analysts agree that surplus coal will remain a problem in 2015 and 2016.

The Australian Bureau of Resources and Energy Economics (BREE) contends that the delayed closure of unprofitable capacity is expected to prolong the supply overhang into 2016/17 and to continue placing downward pressure on prices. Lower prices will diminish the incentive to invest in new capacity and ultimately force less competitive operations to close. Beyond 2017, thermal coal prices are projected to increase as demand increases, supply growth eases and the market balance tightens. In line with higher consumption, world trade in thermal coal is expected to increase at an average yearly rate of 2.8% to 1.24-billion tonnes in 2020.

Metallurgical Coal

Metallurgical coal prices were relatively stable in 2014, in contrast to other bulk commodities, indicating that the market was closer to equilibrium during the year. Nonetheless, many metallurgical coal operations were operating at a loss at the prevailing prices, which forced several mine closures, particularly in the US and Australia. BREE estimates that world production of metallurgical coal has decreased by 25-million tonnes, or about 2%, in 2014.

BREE contends that from 2016, however, the market balance will tighten as growth in steel production in China and India increases and the protracted period of oversupply comes to an end.

World trade of metallurgical coal is forecast to increase by 2.3% to 316-million tonnes in 2015, with China projected to represent the bulk of the growth in import demand and Australia in export supply. With world steel production expected to increase, world trade in metallurgical coal is forecast to increase at an average yearly rate of 1.1% to 334-million tonnes.

The Role of Coal in the Generation of Electricity

The advancement of electricity generation capacity in developing economies is crucial for economic growth and development.

While all existing technologies are being considered to meet the demand for electricity, new capacity under construction, or that has been approved for development, shows that coal-fired generation is likely to continue to be a primary source of electricity generation in future.

As a result of South Africa's abundant coal reserves, including those in the Waterberg basin, in Limpopo, and the existing capital invested along the coal value chain, South Africa is likely to continue to include coal as part of its energy mix.



Picture by Chief Photographer Duane Davis

The Role of Coal in South Africa's Economy

Coal accounts for about 72% of South Africa's primary energy consumption. Most of the country's electricity supply is sourced from coal-fired power plants, with two such large-scale plants – Medupi, in Limpopo, and Kusile, in Mpumalanga – currently under construction, and a third coal-fired power plant under consideration.

Exxaro's Grootegeluk Medupi expansion project (GMEP) will supply 14.6-million tonnes of coal a year to the Medupi power station. In January 2014, Eskom formally informed Exxaro that it would not be able to begin offtake from February 1, 2014, as initially agreed, owing to construction delays at the Medupi power station. An agreement was subsequently reached and approved by both parties' respective boards in the third quarter of 2014, resulting in the ninth addendum to the original coal supply and offtake agreement. The GMEP delivered 3.1-million tonnes of coal to Eskom in 2014, as per the coal supply and offtake agreement.

Meanwhile, Eskom signed a memorandum of understanding (MoU) with Anglo American Inyosi Coal – a black economic-empowerment (BEE) company held by Anglo American (73%) and the Inyosi Consortium (27%) – in November 2014, to supply coal from the New Largo mine, in Mpumalanga, to the Kusile power station.

The deal was signed to re-instate the process of concluding a coal supply agreement, following a breakdown that required a high-level intervention from both companies to salvage the deal. It is believed that Eskom's 51% BEE ownership stipulation for the project was central to negotiations stalling.

Although Eskom can source smaller amounts of coal on short-term agreements, the conclusion of a substantial long-term coal supply agreement for the power station has become a matter of increasing urgency.

Eskom's Coal Supply Cliff

For several years, coal industry players have increasingly referred to Eskom's projected 'coal supply cliff', which could result in yearly shortfalls of between 40-million tons and 60-million tons of coal after 2018. It is estimated that between five and ten new mines, in total costing between R60-billion and R90-billion, will be required to offset the shortfall in demand.

Eskom believes that 120-million tons a year of new mine capacity needs to be available in the next five years.

The utility reported in mid-2014 that it had contracted 1.37-billion tons of the coal it would need over the next 35 years, and that another 2.1-billion tons remained uncontracted.

Most of the coal is sourced from the coalfields around Emalahleni and Middelburg, in Mpumalanga, where the majority of the power stations are located. However, after more than a century of mining, production is expected to drop sharply over the next 10 to 20 years.

In May, Public Enterprises Minister **Lynne Brown** indicated that Eskom faced a 17-million-tonne coal shortfall by 2017 at its coal-fired power plants. The shortfall is expected in 2015, at the Matla, Tutuka and Hendrina power stations, in Mpumalanga. The Kriel and Arnot power stations also located in Mpumalanga are expected to be affected in 2016.

The focus is thus increasingly turning to the coalfields of the Waterberg area, in Limpopo.

Owing to coal qualities in the Waterberg differing from those in Mpumalanga, Eskom is conducting tests to determine what impact the use of Waterberg coal will have on its power stations.

South African Exports

South Africa currently exports 25% of its coal production. According to the US Energy Information Administration, the country exported 78-million tonnes of coal in 2014, with Asia receiving more than half of the exports. India was the main destination, which accounted for 40% of South Africa's coal exports. Europe was the second-largest regional importer of South Africa's coal, followed by Africa, the Middle East and the Americas.

The lack of railway infrastructure to transport coal from the mines to the ports is significantly hampering South Africa's ability to increase its coal exports.

The bulk of South Africa's coal exports are undertaken through the Richards Bay Coal Terminal (RBCT), located at one of the world's deepest seaports, on the north coast of KwaZulu-Natal.

The coal terminal is expected to undergo a further 19-million-tonne-a-year expansion to increase its capacity to 110-million tonnes a year to accommodate junior miners.

For many years, the country's major coal mining companies dominated the exports through the terminal for years, as it was built by shareholders for their exclusive use. However, in 2004, the RBCT started the Quattro programme, making an initial one-million tonnes a year of capacity available to junior black economic-empowerment coal producers to facilitate access to the coal export market. This capacity was ultimately escalated to four-million tonnes a year and



Picture by Chief Photographer Duane Davis

allocated to 23 junior miners through the programme.

The RBCT's expansion to 110-million tonnes is a response to government's granting of large numbers of prospecting rights to prospective junior start-ups and the call for more capacity allocation for junior miners, which follows State freight and logistics group Transnet's criticism in 2013 of the RBCT not providing access for small, black-owned coal miners. It was for this reason that Transnet subsequently suggested that it was likely to proceed with building its own coal export terminal, also to be situated in Richards Bay, to serve "the small guys".

Transnet shelved these plans in 2014, after an industry agreement was struck with the major players for the coal export capacity of Quattro to be doubled from four-million tonnes to eight-million tonnes to benefit small black junior miners.

RBCT CEO **Nosipho Siwisa-Damasane** pointed out at the time that there were various advantages associated with RBCT's expansion as opposed to the construction of a completely new terminal, such as the availability of existing berths and infrastructure that would lead to lower costs. She explained that RBCT had two existing berths available that no greenfield developer would have, stating that it was the "heaviest" investment associated with the creation of an export terminal.

However, the parties have agreed that key to any new development would be Transnet's agreeing to increase its rail capacity to ensure that it matches port expansion.

The RBCT exported 71.3-million tonnes of coal in 2014 – the highest volume ever. While representing an improvement on the previous year's 70.2-million tonnes, this is far below the terminal's current export capacity of 91-million. The gap between actual exports

and the terminal's nameplate capacity has been attributed to inadequate capacity on the coal rail line. The planned capacity increase on this line is expected to go a long way towards addressing this issue.

Besides the RBCT, South African coal producers also export small quantities of coal through the Richards Bay dry bulk multi-purpose terminal and the Durban port. Transnet has spent R80-million to develop coal export capacity at the Port of East London, catering for product from the now beleaguered Eastern Cape coal mining company Elitheni Coal. Transnet reported in June 2014 that the facilities installed to handle coal exports at the Port of East London would be used to handle other commodities and that it would move the coal terminal to the Port of Ngqura, near Port Elizabeth, in five years.

South African coal is also exported through the Maputo cargo terminal and the Matola coal terminal, in neighbouring Mozambique. The coal that is exported through Maputo is from companies that cannot secure an export allocation at the RBCT.

Some commentators believe that regulatory uncertainty is a key factor holding back investment in the coal sector, especially the proposal from government that coal be declared a strategic mineral, which could result in the commodity being subjected to price or export restrictions. This proposal, along with many others, is contained in the Mineral and Petroleum Resources Development Act Amendment Bill, which President **Jacob Zuma** sent back to Parliament for further review in January. The issue remains contentious, with commentators warning that the proposal has added a layer of uncertainty that could lead to much-needed investment in the local coal mining industry being delayed or withheld.

Eskom has been advocating for government

to declare coal a strategic mineral, having raised concern about growing competition from countries, such as India, for the low-grade coal produced in South Africa that is mostly used at its power stations. Declaring coal a strategic mineral will enable Eskom to shore up domestic supply ahead of export.

Outlook

According to the International Energy Agency's annual 'Medium-Term Coal Market Report', released in December 2014, global demand for coal in the next five years will continue to increase, breaking the nine-billion-tonne level by 2019, driven largely by Asia. The supply overhang, however, is forecast to persist and contribute to lower prices.

XMP Consulting senior coal analyst **Xavier Prevost** has warned that quick action is needed to prevent the collapse of the global coal sector. While coal prices in South Africa are very good and getting better, Prevost has indicated that export coal is barely managing to fetch \$60/t, down from as much as \$200/t in the past.

Nonetheless, coal is expected to remain South Africa's primary energy source for some time. The reality is that a developing country like South Africa needs the low-cost energy that coal provides, but investors are fighting shy of coal, which is slowing growth to 2% a year until 2019.

Production from existing mines is limited and there is expected to be an imbalance between supply and demand over the next ten years. The Waterberg coalfield, however, contains an estimated 40% of South Africa's remaining coal resource and is considered to be the main source of coal in the future.



Picture by Chief Photographer Duane Davis

GOLD

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CREAMER MEDIA RESEARCH ASSOCIATE

In September 2014, gold mining giant AngloGold Ashanti proposed, and then days later scrapped, a major restructuring plan. The plan was intended to result in the spin-off of a separate Newco, to be listed in London, housing the company's non-South African gold and exploration assets. AngloGold Ashanti would then focus on its South African portfolio and consider developing a multi-commodity growth strategy in South Africa and beyond over time.

The abrupt decision to scrap the restructuring plan was largely a result of substantial shareholder opposition, particularly with regard to the inclusion of a \$2.1-billion rights issue in the proposal. The rights issue was a necessary component of the deal because the South African Reserve Bank required that AngloGold Ashanti be left debt-free if the restructuring were to proceed.

It is noteworthy to consider the stated motivation behind the proposal – that “separately listed vehicles would allow independent management teams to execute distinct strategies”. This echoed the reasons outlined by mining major Gold Fields for the 2013 spin-off of the bulk of its South African assets into Sibanye Gold: that the two portfolios had differing operational and management requirements and divergent strategic demands, and that the separation of Sibanye would enable the two entities to focus on their respective goals and operate more effectively.

At the time of the Gold Fields unbundling, it was largely viewed as an effort by Gold Fields to protect itself against the negative sentiment that existed towards gold miners with operations in South Africa. Similarly, some have described AngloGold Ashanti's attempted restructuring as an effort to mitigate the risks involved in being a South Africa-focused miner.

Such risks include the country's quick-to-strike, yet underproductive workforce, electricity shortages and the threat of illegal miners, as well as the need for new technology to enhance efficiency and

effectiveness in the industry. These challenges exist in an environment of more general investment limitations, including political risk and uncertainty.

In this context, South Africa's gold output has been declining for several years.

For more than a century, the country had been the world's largest gold producer, but it lost this position to China in 2008 and, since that time, has fallen in the global gold production ranks to sixth position, behind China, Australia, the US, Russia and Peru. South Africa's gold production has declined by an average of 8.2% a year over the past ten years, and its gold production market share has dropped from 13% in 2004 to 5.3% in 2013. The contribution of gold sales to South Africa's total mineral sales has decreased from 30% in 2000 to 12% in 2014. The decline in South Africa's gold production is partially linked to an operating environment that includes ageing mines, rising costs, falling grades and labour-related challenges.

Labour-Related Challenges

A major challenge facing South Africa's gold mining industry is labour, with strike action in the mining industry not only denting the country's image as an investment destination, but also causing production losses that affect the profitability of operations and the viability of marginal mines.

South Africa's gold sector, for many years, has engaged in centralised collective bargaining with regard to wages and conditions of employment. These negotiations involve the Chamber of Mines (CoM) that represents the majority of gold mine employers, and recognised trade unions, which represent their members. For a union to be recognised, it needs to represent at least 30% of employees at a particular operation. As at the end of January 2015, union representation at CoM gold member companies comprised the National Union of Mineworkers (NUM), with 57% of workers; the Association of Mineworkers and Construction Union (AMCU), with 25%, Uasa, with 7%; and

Solidarity, with 2%. Workers who were not members of a union constituted 9%.

The CoM contends that gold mine employees are among the best paid of South Africa's industrial workers. The chamber explains that basic wages in the sector are higher than those of comparably skilled workers in other industries, and that several additional benefits are included in the overall cost of employment for gold mineworkers. CoM figures show that the lowest-paid entry-level underground gold mineworker receives, on average, a basic wage of about R5 700 a month, which compares favourably with basic wage figures for nonmining industries. For example, similar wages in the steel and engineering industry are R4 900, in the motor industry R3 100, in the road and freight industry R4 000, in the civil engineering industry R4 000, in the chemicals industry R5 000 and in the construction industry R1 500.

In September 2013, the CoM, NUM, Uasa and Solidarity, which collectively represented about 72% of workers affected by the collective wage negotiations at the time, reached a two-year wage deal. While AMCU, which represented 17% of workers at the time, did not accept the agreement, sections of the Labour Relations Act allow for the deal to be made applicable to all employees in the bargaining unit, thus making the deal applicable to AMCU members. The wage increases were backdated to July 2013.

In January 2014, AMCU served AngloGold Ashanti, Harmony and Sibanye with notice of its intention to strike at those operations where the union was the majority union at the time of the 2013 wage negotiations. This effort was thwarted when the Labour Court issued an interim interdict against the planned action. In June 2014, the Labour Court declared the interim interdict final, and ruled that any strike action by AMCU or its members relating to wages and conditions of service for the duration of the two-year agreement would be unprotected.

As a result of the interdict, the gold industry was spared the fate of the platinum sector, which was subjected to a crippling five-month strike in 2014. Concern exists, however, that

the current perception is that platinum mineworkers are in a better position than their gold mining colleagues because of that protracted strike.

Gold mining companies have been trying, for some time, to link wage increases to productivity, which will make a portion of employees' pay dependent on the performance of the mine or company. However, collective bargaining makes productivity clauses complex, as an agreement between the largest companies and the majority union is applicable to all employees, but productivity-linked bonuses could be implemented at company level.

The wage agreement reached in 2013 was set to expire at the end of June 2015, and companies and organised labour have been gearing up for new wage negotiations.

Gold Fields has opted out of the CoM's traditional collective bargaining framework for this year's wage negotiations, choosing instead to negotiate an independent agreement with workers at its only remaining South African mine, South Deep. The company has explained that this will enable it to attract and retain the right skills for mechanised mining. Gold Fields subsequently reached a generous agreement in April 2015 with the NUM and Uasa to pay increases of 10% each year for the next three years to the 3 500 people it employs at South Deep.

Meanwhile, the other major gold companies represented by the CoM, including AngloGold Ashanti, Sibanye Gold and Harmony, will enter into collective bargaining.

The 2015 wage talks are taking place at a delicate time for South Africa's gold industry, with gold prices about 40% below their 2011 peak, while water and electricity tariffs, as well as wages, are continuing to outpace increases in inflation. The industry has considered ways to absorb these cost increases

amid declining grades and diminishing productivity levels, with lower overall employment levels an unfortunate, but inevitable, consequence.

At current gold prices, much of the sector is close to, or below break-even levels, placing more jobs at risk. Harmony has warned that it will not survive high wage increases, with CEO **Graham Briggs** further noting that, should high increases be granted, the market can expect the company to engage in massive retrenchments. Similarly, Sibanye has cautioned that, "while delivering short-term gains for employees and unions, [inflated wage hikes] will inevitably result in the loss of jobs and destroy value for all stakeholders in the longer term".

Over the past decade, according to the CoM, the average yearly wage in the sector rose by 180% to about R196 298 a year, while the total number of employees in the sector decreased by one-third to about 119 000 people. Over that same period, South Africa's gold production dropped by about 8.2% a year on average.

Gold companies want to reach a new accord with employees and their labour unions to arrest this downward spiral and restore the industry to more sustainable, long-term footing. AngloGold Ashanti has stated that this "is crucial for the future of one of South Africa's key economic contributors, and indeed for individual mines and their employees, given that companies cannot be expected to persist with unprofitable operations".

The companies will this year propose an 'Economic and Social Sustainability Compact', which will comprise a mutually agreed set of binding principles that will determine the rights and responsibilities of companies and organised labour in respect of workplace activities and consequences,

including wages and conditions of service.

The fundamental principles of the proposed compact will be sustainability through a partnership approach by the companies, the unions and employees. Proposed wage increases and other terms and conditions of employment will be considered with due regard to their impact on the sustainability of the industry and on employment security.

AngloGold Ashanti CEO **Srinivasan Venkatakrishnan** (Venkat) has stated: "When you look at the wage negotiations this year and you look at the backdrop of what has happened [in the] platinum [industry], for example, [we saw] really unsustainable wage increases that [were] followed by job losses."

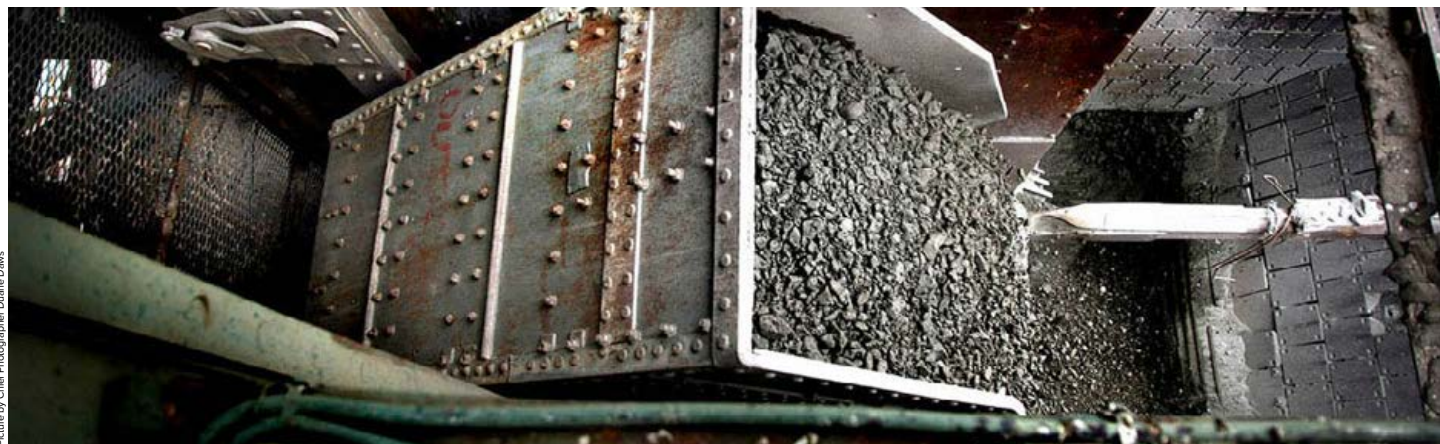
However, sources indicate that the NUM is demanding a wage increase of more than 80% for entry-level underground workers. The union is seeking to raise basic pay for the lowest wage band to R10 500 a month. The union reportedly also wants all other gold mine employees to get an increase of at least 15% and an accommodation allowance of at least R3 500 a month.

Meanwhile, in mid-May, it was reported that AMCU was demanding a monthly wage of R12 500 for workers currently earning about R6 000 a month.

Electricity-Related Challenges

South Africa's growth- and confidence-sapping electricity crisis is affecting the gold mining industry. This challenge is two-fold – rising electricity prices and unreliable electricity supply.

Several gold companies have highlighted the impact of high electricity price increases on their total costs. For example, Sibanye



Picture by Chief Photographer Duane Davis

Gold has noted that, despite slashing its power consumption by 20% since 2007, the company's electricity costs have continued to increase. Electricity currently accounts for about 20% of its operating costs, representing a potential bill of about R3.1-billion in 2015, compared with 9%, or R757-million, in 2014. Sibanye contends that, with labour costs accounting for another 55% of its operating costs, three-quarters of its operating costs are now beyond its control.

Similarly, Harmony Gold has noted that, while it has reduced its energy consumption by 13% since 2012, there has been a 34% increase in the company's electricity costs, bringing its electricity bill to about R2-billion. Briggs has noted that the cost of electricity has increased about 133% over the past five years, describing it as a "massive increase". He says the reality of Harmony Gold's situation is that its ventilation and cooling facilities undoubtedly make the company a big electricity consumer.

While electricity prices are rising, companies are facing an increasingly unreliable electricity supply. State-owned power utility Eskom has warned consumers to expect power-supply shortages for the next three years as it completes the building of new capacity and deals with a major maintenance backlog.

The shortage and unreliability of electricity supply are prompting gold mining companies to consider the viability of generating their own electricity.

For example, Sibanye Gold announced in February that it had planned to build a R3-billion, 150 MW solar power plant, in the North West. The modular plant, expected to come on line in three 50 MW stages, at a site near Driefontein, in 2017, will remove 10% of the company's average daily energy requirements from the national grid. The permitting process for the plant is under way, with funding options being assessed with banks and potential partners for a possible offtake agreement. However, Sibanye has the funds to undertake the project, should it need to be self-funded. It is also planning to undertake an in-depth investigation into the feasibility of its own coal-fired power stations that will contribute an additional 200 MW to 600 MW of the company's energy requirements.

Further, Sibanye is trying to turn highly explosive methane gas into electricity at its Beatrix mine, in the Free State. The gas will serve as a completely free fuel for the

generation of an additional 2 MW of electricity after being captured and brought to surface from depths of more than 800 m.

The company has said that load-shedding has had a significant impact on its operations, and it does not expect the situation to change as Eskom is battling with higher demand and critical power shortages. To mitigate the short-term risk, Sibanye is working with Eskom to manage and reduce the impact of load-shedding on its operations.

However, AngloGold Ashanti contends that, despite the electricity challenges, building its own power stations to provide electricity for its South African gold mines does not pass economic muster and is thus not at the top of its current priority list.

Largely through re-engineering mine cooling and refrigeration, the company has managed to reduce its electricity consumption from the national power grid by 20% in the past six years. It is also working closely with Eskom to lower power consumption during peak periods by shifting its pumping and rock hoisting loads. The company has pointed out that load-shedding has accentuated the need to get the best margin out of available kilowatt hours and, on a staged basis, it intends removing supply from non-essential areas, operating its mill sequences differently and prioritising lower margin operations over higher-margin operations. Venkat has advocated for a long-term solution to be found, but has simultaneously indicated that, for AngloGold Ashanti, "building power stations didn't actually make sense and... using power from the grid is perhaps a better solution".

AngloGold Ashanti has generator sets that kick in for safety reasons when the company needs to evacuate staff from underground operations. It is also installing turbines in underground mines to boost energy regeneration as part of a strategy to recover electricity without spending significant amounts of capital. The company will continue to consider alternative sources of energy, particularly renewable energy, including solar and wind farms.

Meanwhile, specialist tailings miner DRDGold, which was subjected to 67 hours of load-shedding in December 2014, has reported that power cuts and load-shedding do not pose as serious a threat for it as for underground gold producers. The company has noted that the installation of back-up generators has significantly derisked its

operation and will enable it to keep the thickeners in the circuit active.

Eskom is giving a two-hour warning prior to load-shedding being implemented in any of the four load-shedding zones in which DRDGold operates, which will further counteract power-supply risks for the company. DRDGold has also reached a consumption curtailment agreement with Eskom, in terms of which the company reduces, on request, total consumption by an agreed percentage during load-shedding hours. Subsequently, the company will maintain uninterrupted tonnage throughput, although recoveries might reduce, owing to certain parts of the operating line shutting down during the load-reduction periods.

Prospects

Despite the decline in South Africa's gold production and the ongoing challenges facing the sector, gold mining remains an important part of the country's economy.

It is believed, however, that the development of new technologies will be essential for the future of the industry.

The need for new technology is compelling, as only 60% of the gold ore in South Africa's rich Witwatersrand basin is accessible using current drill-and-blast technology, with 40% of the gold left behind in pillars to keep seismicity at bay. The current mining method loses a further 25% to 30% of that 60% because blasting breaks the ore into so many pieces that not all of them can be recovered, particularly as fractured sizes range from fine powder to large boulders. Once blasted, the product is moved up to seven times, which results in more losses. On average, there is 200% more waste than hold in the mix moved with dilution being as high as 1 500%, which means that large volumes of nonpay material have to be transported out of ever-deepening cavities. After extracting only 60% of accessible ore, 100 g of gold in the ground becomes 30 g or 25 g of gold on surface.

Several mining companies, most notably, AngloGold Ashanti, are investing in the development of new technologies to deal with this challenge.

If the local mining industry is successful in finding a viable new alternative mining method, it will be able to not only mine all remaining pillars and go to ultradepths, but also reopen a large number of closed mine shafts and revive mining ghost towns.

IRON-ORE

MARTIN ZHUWAKINYU
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Iron-ore miners, like producers of other commodities, are adjusting to the reality that years of a commodity supercycle driven by a robustly growing China might be over.

China registered its lowest economic growth rate in 24 years during 2014, when its gross domestic product (GDP) grew by 7.4% – 0.3 percentage points lower than the previous year's figure – owing to a housing slump and industrial overcapacity. The International Monetary Fund forecasts a further decline in GDP growth to 6.8% in 2015.

As 98% of the world's iron-ore is used in steelmaking and China accounts for about half of global steel production, iron-ore producers have been heavily exposed to the slowdown in the Asian giant.

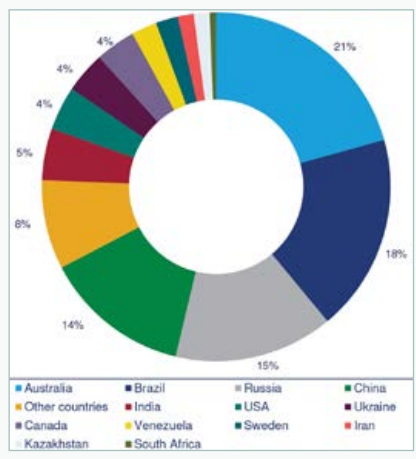
Decelerating growth in China has coincided with initiatives by the largest producers of the ferrous metal – Brazil's Vale and its Anglo-Australian peers, Rio Tinto and BHP Billiton – to raise their collective output from below 700-million tonnes a year to more than 800-million tonnes a year currently, with plans to increase beyond one-billion tonnes in the next few years. The fourth-largest producer, Fortescue Metals Group, a strident critic of the ongoing expansions, increased its output from 41-million tonnes to 124-million tonnes a year during the 2014 financial year and expects to produce up to 160-million tonnes during the year to June 30. It has shelved previously planned expansion projects.

Swiss financial services group UBS estimates that the ongoing expansion projects will result in output exceeding demand by

Iron-ore reserves

The world's iron-ore endowment is estimated at 170-billion tonnes – containing 80-billion tonnes of iron – enough to sustain mining at current output levels for up to 200 years. Australia holds the largest economically demonstrable resources, at 21% of the total, followed by Brazil, with 18%, Russia (15%) and China (14%).

67% of the world's crude economically demonstrable iron-ore resources hosted by four countries



Source: US Geological Survey

45-million tonnes in 2015 and by 215-million tonnes in 2018.

Slowing growth in China – which imports about 60% of the world's seaborne iron-ore – and the increased supply that has been delivered to the market over the past few years have resulted in a glut, which subsequently lead to the benchmark iron-ore price declining by more than 60%, from about \$135/t at the beginning of 2014 to below \$50/t in April, before rebounding to more than \$60/t about a month later. Some analysts

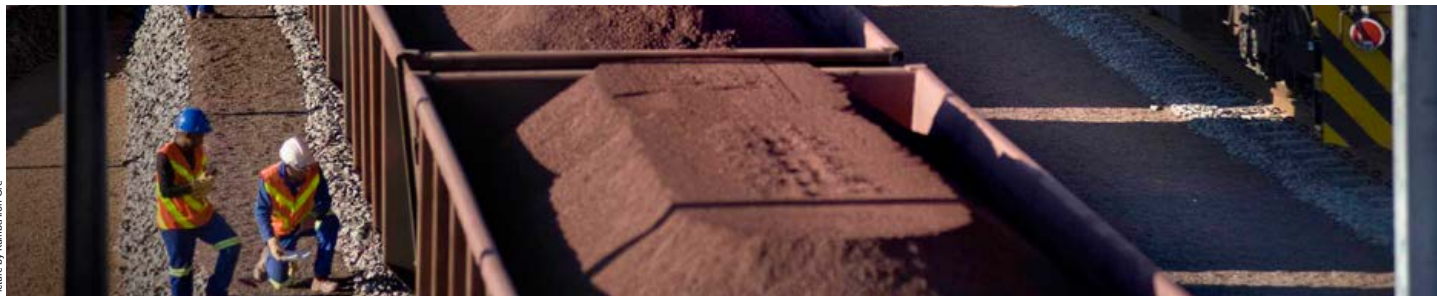
attributed the recovery to a moratorium by BHP Billiton on a major debottlenecking of Australia's Port Hedland, the world's largest bulk export terminal.

The price recovery is unlikely to be sustainable, as the supply glut is set to worsen. Vale reported an all-time quarterly production high of 74.5-million tonnes for the first three months of 2015. The supply tide is expected to be increased by a further 60-million tonnes a year from Rio Tinto's expansion in the Pilbara region of Western Australia and by another 55-million tonnes a year when Hancock Prospecting's Roy Hill mine, also located in the Pilbara, starts production this year. Yet more supply will come from Anglo American's low-cost Minas-Rio mine, in Brazil, which came on stream in October 2014 and is ramping up to 11-million tonnes this year and then to 26.5-million tonnes a year by mid-2016.

The continued iron-ore supply glut and a decline in Chinese steel production from 823-million tonnes in 2014 to an estimated 814-million in 2015 are expected to drive the benchmark iron-ore price lower in 2015 and 2016.

The Western Australian Treasury expects the headline iron-ore price to average \$47/t in the next financial year, down from an assumption of \$77/t in the December 2014 midyear review. It predicts that the price will recover slowly over the next four financial years, averaging about \$62/t in the 2018/19 financial year, on the back of slowing supply growth.

For their part, the World Bank and UBS Group respectively envisage the price to average \$63/t and \$50/t in 2015. Citigroup believes the price will plunge to between



Picture by Kumba Iron Ore



\$30/t and \$39/t in the second half of 2015.

The major producers appear to have embarked on production capacity expansion during the past few years in the belief that this would force higher-cost and smaller producers out of the market, since it costs them about \$20 to \$30 to dig a tonne of iron-ore out of the ground, which means they are operating profitably, even at current price levels.

Higher-cost producers are being squeezed out, with about 33% of such miners in China having ceased production in 2014 and the percentage forecast to increase to 45% by the end of 2015. In Australia, Arrium has had to close one of its two iron-ore mines and BC Iron has warned it might have to do the same. Fellow Pilbara iron-ore miner Atlas Iron was also forced to close its mines, but these are now operational, following cost-saving agreements with key contractors that significantly lowered the company's break-even cost. Elsewhere, Cliffs Natural Resources has suspended operations at a mine, in Canada, and is restructuring its business in the US to focus on domestic sales rather than compete in the seaborne iron-ore market.

The global supply glut and plummeting prices are also threatening the iron-ore ambitions of West Africa, which, at the height of the commodities boom in the past decade, attracted miners seeking untapped deposits of the steelmaking ingredient, as well as diamonds, gold and bauxite, besides other minerals. African Minerals, for example, had to suspend operations at the Tonkolili mine, in Sierra Leone, in November 2014, with the mine going into administration in March, after failing to repay its partner, China's Shandong Iron & Steel Group.

Shandong acquired the 75% shareholding in Tonkolili it did not already own in April and plans to invest \$600-million and boost production by 25%. Despite an announcement

by Sierra Leone's President **Ernest Bai Koroma** in early May that production would resume soon, it is not clear when this will take place and questions linger about whether the operation will be profitable. London Mining, which operated the Marampa mine, also in Sierra Leone, has also gone into administration, owing to debt, high costs, low iron-ore prices and the outbreak of Ebola in 2014.

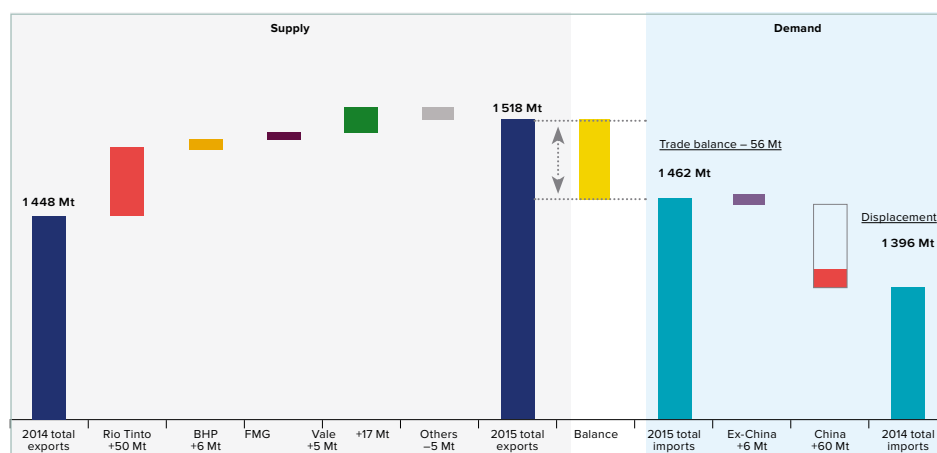
Energy, metals and mining research and consultancy group Wood Mackenzie has forecast that West African iron-ore production could decline from 25-million tonnes in 2015 to zero in two years, if current market conditions persist. Most iron-ore mines in the region require a long-term price of more than \$100/t to be profitable.

In Australia, Fortescue has suggested that producers cap output to stabilise prices and has launched a campaign, Our Iron Ore, which aims to gain public support against the major producers' ongoing expansion projects. It is estimated the Australian federal budget will suffer a A\$30-billion revenue writedown over the next four years because of the drop in iron-ore prices. Amid

this, Fortescue called for an inquiry into Australia's iron-ore sector. The suggestion was rejected by the Australian government, with Industry and Science Minister **Ian Macfarlane** saying in May that an inquiry would be an "amazing gift" to competing producers in Brazil. Prime Minister **Tony Abbott** added that no inquiry would be allowed to turn into a witch-hunt.

While capacity expansion projects are continuing, Vale has announced it will replace some old higher-cost iron-ore production as new capacity comes on stream, the clearest sign yet that the world's largest iron-ore producer could reduce future production. BHP Billiton has deferred a planned \$600-million project to debottleneck the Port Hedland bulk export terminal, a decision that will slow down the final stages of a \$120-billion push to raise output. The halt followed the move by Rio Tinto last year to delay an investment decision on the \$1-billion Silvergrass mine, in Western Australia, until 2016 and the decision by Fortescue to abandon plans to build a \$105-million processing plant.

Supply and demand of iron-ore in 2015



Source: Wood Mackenzie
Mt – million tonnes

South African Iron-Ore Market

South Africa ranks among the top ten iron-ore mining countries in the world, with much of the production taking place in the Northern Cape, which is endowed with resources estimated at about three-billion tonnes.

The less-mined Bushveld Igneous Complex (BIC) potentially hosts more than 20-billion tonnes in the form of titanium magnetite deposits in its upper zone, but exploitation of this resource is partly hampered by the lack of a rail corridor to the coast and other infrastructure. The country's only dedicated iron-ore corridor, the 861 km Sishen–Saldanha export channel, services mines in the Northern Cape.

The country's iron-ore market is dominated by diversified major Anglo American's 69.7%-owned subsidiary, Kumba Iron Ore, which operates the Sishen and Kolomela mines, in the Northern Cape, and the depleting Thabazimbi mine, in Limpopo. Kumba produced 48.2-million tonnes in 2014.

Associated Manganese (Assmang), which is jointly owned by Assore and black-empowered group African Rainbow Minerals, is the second-largest producer. Its two mines, Khumani and Beeshoek, both located in the Northern Cape, produced 16.05-million tonnes during the year ended June 30, 2014, and 7.97-million tonnes during the six months to December 31, 2014.

The third-largest producer is the beleaguered Mapochs mine, in Limpopo, which produced 721 000 t of fines ore and 1.59-million tonnes of lumpy ore in 2014. The mine filed for business rescue at the end of April, a fortnight after its primary customer and majority shareholder, Evraz Highveld Vanadium and Steel had done so, citing severe operational difficulties. The other shareholders of the mine are Umnotho Iron & Vanadium and the Mapochs Mine Community Trust.

Besides these producers, several juniors are scouring the country for iron-ore deposits or developing projects. These include Bushveld Minerals, which is exploring in Limpopo, where it has defined a 718-million-tonne titaniferous magnetite resource that also contains vanadium and phosphate. The other players are Ferrum

Crescent, which is focusing on the Moonlight Crescent iron-ore project, in Limpopo; Sable Metals & Minerals, a junior scrutinising vanadium and iron-ore prospects; and Ironveld, which has proved the viability of mining 2.4-million tonnes of magnetite a year in Limpopo as feedstock for an eventual one-million-tonne-a-year pig iron plant that will also produce vanadium and titanium.

Meanwhile, Palabora Mining, which for many years focused only on copper production, stockpiling magnetite as a by-product, is depending increasingly on magnetite, as the copper mine needs new investment to extend its operating life. China's Hebei Iron & Steel Group, which acquired Rio Tinto's 57.7% interest in Palabora Mining in 2013, and South Africa's Industrial Development Corporation are planning a \$4.5-million steel mill that will use the magnetite tailings as feedstock.

Analysts say iron-ore prices will have to drop to about \$30/t and linger at that level for companies like Kumba to consider scaling back production. Two-thirds of the company's production is lumpy product, unlike the fine, sand-like material of other mines, which attracts a premium. Some mines that produce fine ore convert it to pellets to attract the premium. Any curtailment in the production of pellets and lumpy material could result in a sharp increase in premiums, an opportunity that a company like Kumba would not like to miss, resulting in delays in any large-scale closures.

However, the company, which is barely profitable at current prices, has taken several measures in response to depressed prices, including slashing near-term project capital expenditure by 40%, retrenching about 40% of the head office staff and revising the stripping ratio at Sishen. These measures have increased the value of the mine, but shortened its operating life by about two years. Further, Kumba has suspended the low-grade mining project at Thabazimbi and is contemplating selling or mothballing the operation.

Assmang has reported that, like Kumba, it is just making a profit at current prices. It says projects like the wet high-intensity separation plant at the Khumani mine – which is ramping up to full production – could help improve the company's economies of scale. Assmang states that the impact of waning demand has been partially mitigated by the weakening rand.

Prospects

The price recovery to more than \$60/t in May is not expected to remain for long. While the World Bank and UBS Group expect an average of \$63/t and \$50/t respectively for 2015, Citigroup is more bearish, predicting that prices will settle back to the \$30/t range, a forecast that is in line with the prediction of Australia's Treasurer, **Joe Hockey**, who is contemplating a decline to \$35/t.

The bearish outlook is based on high production at BHP Billiton and Rio Tinto. Even though the former has delayed the Port Hedland debottlenecking project, intended to raise capacity by 20-million tonnes a year, it remains on course to ship 270-million tonnes in 2015. Wood Mackenzie speculates that, in deferring the debottlenecking project, BHP Billiton might have opted for more gradual growth at lower capital cost. The firm estimates that BHP Billiton will attain a run rate of 290-million tonnes a year in five years.

If prices persist in the \$60/t range, many miners will struggle to operate profitably. Some commentators forecast that supply from miners with capacity of one-million tonnes to three-million tonnes a year – which typically lack contracts, do not have integrated logistics and often sell product at a discount to index – will decline by about 80-million tonnes in 2015. Production from mining companies with capacity of 3-million tonnes to 15-million tonnes a year, which typically lack an integrated logistics system to keep costs and mine lower-grade resources, is forecast to decline by 75-million tonnes in 2015.

However, the decline in supply from the smaller miners will be more than offset by rising volumes from the majors. Rio Tinto expects to produce 40-million tonnes more in 2015, BHP Billiton expects to produce 10-million tonnes to 12-million tonnes more in 2015, and FMG expects to produce at least ten-million tonnes more. Vale is targeting 13-million tonnes more.

Additional supply will also come from operations such as Anglo American's 26.5-million-tonne-a-year Minas-Rio project, in Brazil, which shipped its first ore in October 2014 and Hancock Prospecting's 55-million-tonne-a-year Roy Hill mine, in Australia, which is on track to ship its first ore by September, with ramp-up to full capacity likely to take 30 months.

PLATINUM

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The South African platinum mining industry, which produces most of the world's primary platinum supply, is under pressure, with an estimated 40% to 50% of the country's platinum mines losing money. Having emerged from the bruising five-month Association of Mineworkers and Construction Union-championed strike in 2014, which wiped about 1.3-million ounces from the market, producers are now battling rising costs and weak metal prices.

The platinum price averaged \$1 388/oz in 2014, which, according to GFMS analysts at Thomson Reuters, is the lowest yearly average in seven years. Prices remained weak in the first half of 2015, as above-ground stocks cushioned the supply chain and recycled metals restrained prices.

Platinum producers are facing significant cost pressures, mainly owing to the above-headline-inflation wage settlements and electricity price increases of recent years. The most significant producer, Anglo American Platinum (Amplats), reports that mining costs have risen at almost double the rate of inflation since 2008, reporting mining inflation of about 8.3% in 2014. GFMS estimates that South African producers have experienced a 5% increase in their total cash costs to \$1 272 a platinum-equivalent ounce in 2014, which compares with \$1 008/oz in Zimbabwe and \$939/oz in North America.

Rising costs, labour unrest and persistent weakness in the market have pushed the industry into radical restructuring, with companies selling off underperforming assets, closing old shafts and reviving arguments for mechanisation, automation and modernisation of the country's deep-level, labour-intensive underground mines.

The restructuring efforts, which started in 2013, have already had a severe impact on employment in the industry. The National Union of Mineworkers estimates that the platinum sector has shed about 35 000 jobs since 2012. Mineral Resources Minister Ngoako Ramatlhodi has expressed concern



Picture by Chief Photographer Duane Davis

about the rate at which retrenchments have been taking place and said after a meeting of the Mining Industry Growth, Development and Employment Task Team in May this year that a subcommittee had been tasked to investigate the matter of retrenchments.

Number-three platinum producer Lonmin recently announced it will potentially lay off 3 500 workers. The company is targeting a 10% reduction in its labour costs, which represent about 60% of its total costs. Unions have vowed to approach the courts and the Department of Mineral Resources to fight the planned retrenchments, which Lonmin intends to manage through a voluntary process, rather than forced retrenchments.

When Amplats unveiled its major restructuring plans in 2013, the company was lambasted by government and unions over the number of jobs it had planned to cut. Amplats initially estimated as many as 14 000 job cuts, but later scaled back retrenchments to 6 000. The company is still reducing its employee numbers as part of the 2013 restructuring programme and in April this year, announced it would lay off 474 out of a group of 1 248 employees at its Khomanani mine, in Rustenburg, in the North West. The remaining employees from this group were offered other positions.

Impala Platinum (Implats), which is the

second-largest platinum producer, has so far stayed clear of retrenchments.

Industry Restructuring

The South African platinum sector is in the middle of a major shake-up, with participants selling off underperforming assets. Many of the major producers have been using profitable assets in recent years to subsidise marginal shafts and analysts say that selling these mines will force new owners to either make them more efficient or to close the shafts.

Amplats is contemplating exiting two mines and its shareholding in two joint ventures (JVs), while Implats is overhauling Impala Rustenburg to boost productivity.

Amplats' restructuring centres on the strategic decisions it announced in January 2013, following a comprehensive review of its operations. The review's immediate focus was to reduce costs, prioritise capital, improve efficiencies and tailor platinum-group metals (PGMs) supply to the market. The long-term focus is on reconfiguring operations to concentrate on higher margins and more mechanised operations.

The two Amplats mines marked for divestment are Rustenburg, in the North West, and Union, in Limpopo, which is the group's

worst-performing operation. Parent company Anglo American is reportedly favouring an option of listing these assets on a stock exchange rather than the potential sale of the mines as potential buyers are struggling to meet the company's price expectations. Amplats will also exit the Pandora JV with Lonmin, in the North West, and the Bokoni JV with Atlatsa Resources, in Limpopo. Lonmin has right of first refusal over Amplats' stake in Pandora and the right to match any existing bid for the asset. Sibanye Gold, Northam Platinum and community-owned Baroka Platinum are among the parties that have shown an interest in acquiring the assets that Amplats plans to sell.

Implats also announced a major revamp and in February outlined its strategic priorities. The company initially resolved to sell its Marula mine, in Limpopo, and to reposition Impala Rustenburg, in the North West, into a smaller, more concentrated mining operation with access to new, modern shaft complexes. However, it has since decided to keep the Marula mine and to improve the performance of the operation instead. Implats has also scaled back on capital expansions and delayed several growth projects.

Lonmin outlined its strategy in November 2014, which involves reducing the group's costs by R2-billion over three years through freezing general recruitment, natural attrition and the reduction of contractors. Of the targeted savings, R600-million will come from operational efficiencies, including 15%-better crew efficiencies and 5%-better process recoveries. However, in April, Lonmin announced further cost savings, which may result in 3 500 job cuts.

Several smaller operations have also closed down in recent years in response to weak prices and soft demand, including the Crocodile River mine, in the North West, which Eastern Platinum (Eastplats) placed on care and maintenance in 2013. Eastplats has since agreed to a buyout from China's Hebei Zhongbo Platinum. Eastplats shareholders approved the deal in February.

The Chromite Tailings Retreatment Plant (CTRP), adjacent to the Kroondal mine in the North West, ceased to operate in 2012. CTRP is a JV between Aquarius, Sylvania South Africa and GB Mining. Aquarius also placed its Everest mine on care and maintenance in mid-2014.

The Everest mine has since been given a

new lease of life, when Northam Platinum announced in February that it was buying the operation for R450-million. Now renamed Booysendal South, the mine forms an important part of Northam's growth aspirations.

Mechanisation and Automation

Increasing costs and declining productivity have revived arguments in favour of mechanising and automating South Africa's platinum mines. University of the Witwatersrand Centre for Mechanised Mining Systems director **Declan Vogt** believes mines have to be run like factories to become more profitable. Mechanisation could also improve safety in deep-level mines.

One of the champions of the industry's modernisation is Amplats CEO **Chris Griffith**, who believes that the current technology on the market has made mechanisation a more viable option. Amplats is working on extending mechanisation and says it could mechanise 71% of its operations, from 31% currently. The company has already fully mechanised its Bathopele shaft, in the North West. Bathopele is a bord-and-pillar operation using low-profile equipment and is three times more productive than Amplats' conventional mines. The company also plans to introduce mechanisation at the Twickenham mine, in Limpopo. Twickenham will be the first hard-rock mechanised mine to operate with extra-low and ultralow profile mining technology.

Other industry participants considering mechanisation include Royal Bafokeng Platinum (RBPlat), which is planning to use mechanised mining methods at its Styldrift mine, in the North West; Ivanhoe Mines, which is developing the Platreef mine, in Limpopo; and Northam, which owns mines in Limpopo and Mpumalanga. Nkwe Platinum is also planning a mechanised mine at Garatau, in Limpopo, and Wesizwe Platinum has indicated that its Waterberg deposit, if developed into a mine, will be a semi-mechanised operation.

Supply and Demand

South Africa and Russia are the two leading platinum and palladium ore producers. South Africa is the largest producer of platinum and the second-largest producer of

palladium. The world's largest known PGM resource is found in South Africa's Bushveld Igneous Complex, which **Hans Merensky** discovered in 1924.

In 2004, South Africa's mines provided more than two-thirds of the world's total primary and secondary supply. In 2013, the country's share was fractionally more than half of the total, with secondary or recycled metal providing more than a quarter. After the strike in 2014, the country's share of gross platinum supply dropped significantly.

The World Platinum Investment Council (WPIC), which the top six platinum producers established in 2014 to promote platinum as an investment vehicle, estimates the platinum market ended 2014 in a deficit of 670 000 oz, which lowered above-ground stocks to 2.80-million ounces by year-end. WPIC's definition of above-ground stocks exclude exchange-traded funds, metal held by exchanges and industry working inventories of mining producers, refiners, fabricators and end-users. They are typically holdings from which a supply/demand shortfall can be readily supplied or to which a supply/demand surplus can readily flow.

In its 'Platinum Quarterly Q1 2015' report, the WPIC states that total platinum mining supply in 2014 was 5.23-million ounces, compared with 5.86-million ounces in 2013. South Africa produced 3.12-million ounces, compared with 4.36-million ounces in 2013. Recycled platinum, which comes from automotive catalytic converters, jewellery and recycled electrical equipment added 2.04-million ounces to the total platinum supply in 2014, buoyed by an increase in autocatalysts recycling, taking total supply to 7.27-million ounces.

During the first three months of 2015, analysis from WPIC's research partner SFA (Oxford) shows that demand exceeded supply, resulting in a market deficit of 160 000 oz. First-quarter refined production was estimated at 1.42-million ounces, with total mining supply at 1.39-million ounces. The WPIC reports that South African production had increased by about 15 000 oz to 995 000 oz relative to the fourth quarter of 2014. Supply from the recycling industry reduced to about 450 000 oz, from 480 000 oz in the final quarter of 2014. Total first-quarter platinum supply declined to 1.84-million ounces, from 1.86-million ounces in the fourth quarter of last year.

The main demand for platinum stems from

automotive catalytic converters and jewellery. Demand growth has been relatively weak over the past decade. In 2014, total global platinum demand decreased by 7% year-on-year to 7.94-million ounces. However, platinum demand increased in the first quarter of 2015, compared with the previous quarter owing to growth in automotive and jewellery demand.

However, as platinum is used but never consumed, it has great potential to reappear as recycled metal, which makes it imperative for ongoing marketing to create demand for newly mined metal. Platinum mining companies believe the answer could be in fuel cell technology. Platinum has a unique ability to react with hydrogen, making it an efficient catalyst for fuel cells. Fuel cells contributed significantly to the 4% growth in platinum demand from end-users other than the traditional markets in 2014.

The mainstream adoption of fuel cell vehicles – electric cars powered by hydrogen fuel cells instead of batteries – is expected to provide a significant boost to platinum demand. Implats has said that platinum demand in Europe will increase to 6.6-million ounces in 2050, if fuel cell cars succeed in dominating the electric vehicle segment. Conversely, if battery cars dominate, demand for platinum in Europe will decline to 2.5-million ounces in the same period. Toyota, Honda and Hyundai are all expected to release fuel cell cars in 2016, with Daimler likely to follow suit in 2017.

In South Africa, electricity supply problems are offering a major opportunity for producers to stimulate the offtake of platinum. A call has been made for the country to commit to 1 000 MW of fuel cell generated electricity by 2020. While it will only represent about 2% of South Africa's power supply, it will create demand for 5% more platinum metal.

The Chamber of Mines has gone off-grid

and is using a 100 kW fuel cell to power its head office building in Johannesburg's inner city. The \$1-million fuel cell installation will provide the building with all the electricity it needs at a 20% discount over 15 years.

Implats is also studying the feasibility of taking its entire platinum refinery, in Springs, east of Johannesburg, in Gauteng, off the national grid. The company is planning an initial 1.8 MW of stationary fuel power capacity, which it will increase to about 22 MW of fuel cell power to get off the Eskom grid. Implats is aiming to start producing the initial stationary power from fuel cells in early 2016. The group will in future consider opportunities to deploy stationary power plants with the ultimate aim of using fuel cells as the core energy source for its underground mining equipment, which could enhance mine ventilation, reduce heat and eliminate noxious and sulphurous emissions.

Amplats has been using fuel cell powered mine locomotives at one of its operations for some time. The company also has a fully off-grid power system sufficient for lighting, cooking, refrigeration, radio and television on field trial in Kroonstad, in the Free State.

Outlook

Platinum producers are cautioning that weak market conditions are expected to persist. Lonmin expects platinum prices to remain weak for another two years, while Implats has said that prices are likely to stay "lower for longer". Smaller producers, such as Northam and RBPlat, are also not betting on market conditions improving in the near term.

Above-ground stocks and recycled metal are still restraining prices, although forecast deficit markets are expected to erode the level of inventory and should bode well for prices in the medium to long term. The WPIC is fore-

casting a platinum market deficit of 190 000 oz in 2015. Above-ground stocks are expected to reduce to 2.61-million ounces by the end of 2015, which will be 7% lower than the level at the end of 2014.

In the 'Platinum and Palladium Survey 2015', GFMS analysts forecast an average price of \$1 170/oz in 2015, which will be 16% lower than the average for 2014. However, analysts warn that platinum may test \$1 000/oz this year, especially if platinum supply increases substantially on higher mine production from South Africa and a rise in autocatalyst scrap.

GFMS and WPIC are forecasting higher mine production from South Africa as output recovers from the strike-hit 2014 level. Robust autocatalyst recycling growth of about 10% is also expected to offset a decline in jewellery recycling.

Conversely, demand is expected to increase in 2015, supported by gains from the automotive market and a projected increase in demand from the jewellery sector. The WPIC forecasts a 3% increase in total demand to 8.16-million ounces in 2015. GFMS forecasts demand to increase by 6% to 7.72-million ounces this year.

GFMS states that autocatalysts are expected to comprise 41% of demand and that demand from this segment of the market is expected to reach a seven-year high. However, demand will still be below prerecession levels.

French bank Natixis expects new European vehicle sales and higher jewellery demand in China to lift platinum prices in 2015 and 2016. In its base case scenario, Natixis analysts forecast platinum prices to average \$1 285/oz in 2015 and \$1 500/oz in 2016.

GFMS, meanwhile, estimates that about 500 000 oz of South African production has to be cut to substantially increase prices. However, closing and reopening shafts are expensive and producers that have shuttered output will be worst positioned to benefit from an upturn in prices.

Medium- to long-term demand and supply fundamentals could be impacted on by more secondary supply entering the PGM market. RBPlat CEO **Steve Phiri** describes recycling as the biggest threat to South African platinum supply, saying autocatalyst manufacturers are less keen to rely on primary supply from South Africa as a result of labour and other issues. The recycling industry could account for about one-third of the total market by 2020, compared with about one-quarter currently.



Picture by Chief Photographer Duane Davis



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