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MINING IN AFRICA TOWARDS 2020

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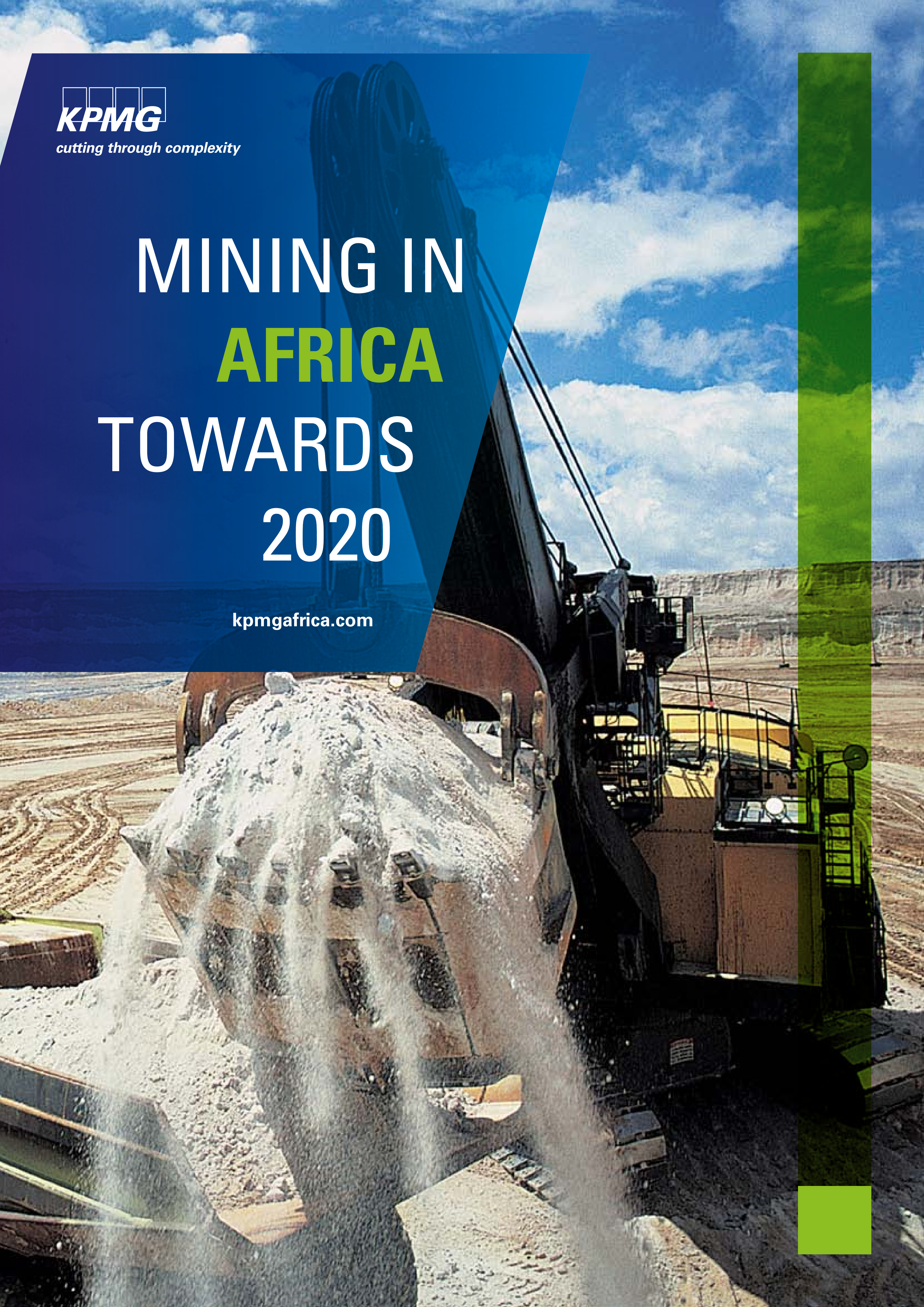

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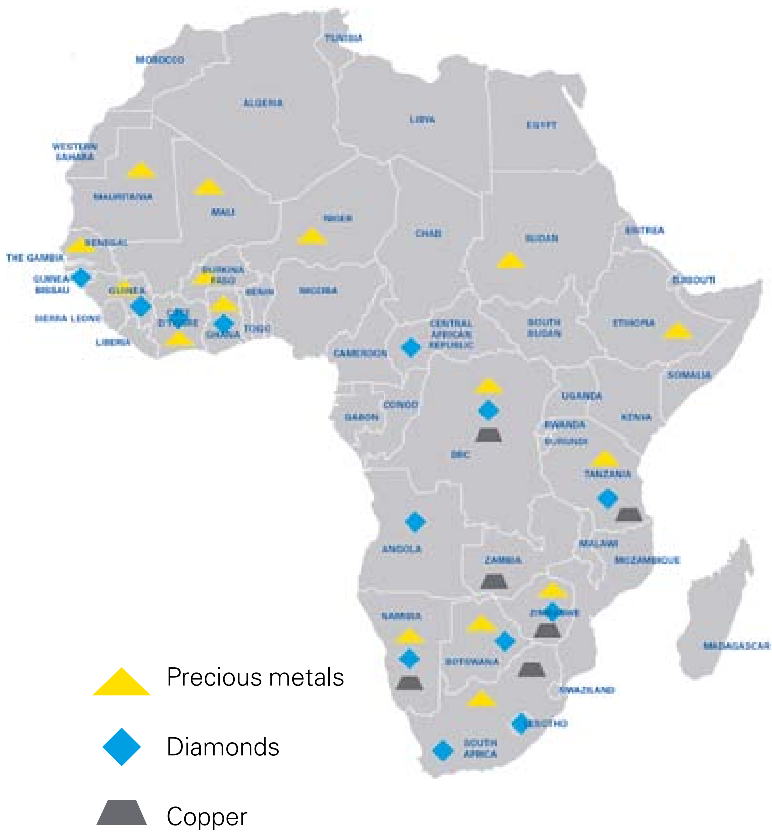
BACKGROUND AND INTRODUCTION

The African continent is richly endowed with mineral resources – this cannot be disputed. The US Geological Survey (USGS) ranks Africa as the largest or second-largest reserve worldwide for bauxite (the main source of aluminium), cobalt (used to make alloys and batteries), industrial diamonds (needed to cut hard materials), manganese (the anticorrosive element in steel), phosphate rock (a key ingredient in fertilisers), platinum group metals (a primary component in automotive catalytic convertors), soda ash (an element in glass production), vermiculite (a component in fireproof materials) and zirconium (used to manufacture heat-resistant ceramic materials). All of these products except for fertilizers are found in everyday life within the automobiles we use to travel from point A to point B. And in an eco-conscious world where renewable materials are becoming more important, many new automobiles have an increasing volume of plant-based materials in them, so phosphate rock is as important to the cars being manufactured today as the other minerals found on the continent. This is an illustration of how world citizens are directly and indirectly linked to the fortunes of the African mining sector. But the application of its metal and mineral produce goes much further than just automobiles; other examples include smartphones, modern sports equipment and beverage cans.

However, looking back to before these rather modern products became reliant on African minerals; the continent has a history of acting as a feedstock for the world's mineral hunger. British, Belgian and Portuguese colonies produced precious metals and gems since the early 1800s while the majority of private foreign capital invested on the continent between 1870 and the Second World War was channelled to mining. "A wide range of African metallic and non-metallic ores played a vital – and in some cases an indispensable – role in the Allied victory in 1945," wrote Raymond Dumett in a 1985 edition of the Journal of African History. Admittedly, even though the post-colonial period led to an increase in interest from non-colonial powers to mine Africa's resources, by the early 1990s the continent was still only receiving some 5% of global exploration and mining development expenditure. A concerted effort by the World Bank to understand the shortcomings of African territories in the eyes of both junior and major miners revealed a need for infrastructure, stable legal systems, a predictable fiscal regime, profit repatriation guarantees, and access to foreign exchange. The remarkable changes that took Africa from "the hopeless continent" in 2000 to the one where the "sun shines bright" in 2011 (both headlines from The Economist) resulted in the continent receiving 15% of global exploration expenditure and mining investment during 2012.

As rewarding as the continent's mining riches have been over the past centuries, the future could be even brighter. "The true extent of Africa's vast wealth of resources is hard to guess. Geologists have picked over most of the rest of the globe in search of minerals, yet huge swathes of Africa remain largely unprobed. But the immense ore deposits so far discovered and soaring commodity prices on the back of rip-roaring Chinese demand have convinced the world's miners that the continent is the next big frontier," wrote The Economist in February 2012. There are only a few countries on the continent that do not have some form of mineral resources that could be exploited. Out of the 54 African sovereign states (including islands) recorded by the United Nations (UN), the Central Intelligence Agency (CIA) lists 46 as having mineral resources of "commercial importance" – see the last two pages of this document for a list of African countries' mineral resources. The organisation adds that mineral products in its list are recorded "only if they make a significant contribution to the economy, or are likely to do so in the future".



Sources: US Geological Survey, NKC Research

AFRICAN MINING TODAY

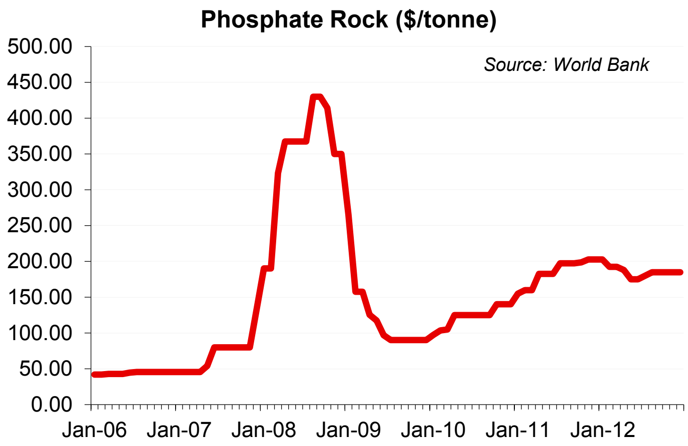
Regions & Key Commodities

The mining and quarrying of some 60 mineral products currently represents around 20% of Africa's economic activity, while minerals are the continent's second-largest export category – worth 10% of the continent's total exports – only exceeded by hydrocarbons. More than 80% by value of these mineral commodities originate in just five countries: platinum leader South Africa; diamond-rich Botswana; as well as gold producers Ghana, Burkina Faso and Tanzania. The African continent contributed 6.5% of the world's mineral exports during 2011 from mining 20% of the world's land area. From a regional perspective, members of the **Southern African Development Community (SADC)** produce two-thirds of Africa's mineral exports by value. The biggest player in the region is South Africa (the continent's largest economy at present) who has almost all the commodities essential for international competition except crude oil and bauxite. Together with its northern neighbour Zimbabwe, these two economies hold the majority of the world's platinum group metals (PGMs) reserves. To the west of Zimbabwe is the diamond-rich Botswana – who is the world's largest producer by value of these precious stones – and to its north Angola. Other key mineral producers in the region are Namibia (uranium), Zambia (copper) and the Democratic Republic of the Congo (copper and cobalt).

The Bench Marks Foundation argues that mining is a curse on SADC due to a lack of management capacity at community, corporate and government levels to deal with the adverse effects of mineral extraction on the environment. More worryingly, there is a strong view that the region did not benefit to its potential from the commodity boom seen during most of the 2000s. An investigation by the Financial Times revealed several negative factors which held back the countries' mining sectors including increasing resource nationalism (discussed below), transport infrastructure shortcomings, the deepening of established mines (some decades old), labour challenges, and political risk. At a grassroots level, Southern African Resource Watch (SARW) has also identified a lack of resource benefits transferred to Africans due to corruption, weak regulation and judicial frameworks, and unaccountable bureaucracies. But the fact remains that mining along with hydrocarbons are the backbone of Southern Africa's economies. And given the economic trajectory envisioned for these countries over the next decade, this feature will not change any time soon.

East Africa is less dependent on mineral exports than most other regions on the continent and more reliant on tourism and agricultural output – tea, coffee and horticulture in particular – for economic activity and employment. Still, the **East African Community (EAC)** has several mineral belts that produce (amongst other commodities) tanzanite and gold. The latter is the region's biggest mining resource with Tanzania being the largest regional miner of the yellow metal at present, while exploration has also been conducted in the country for nickel and uranium. Gold reserves in the country are estimated to be over 30 million ounces, with only a small part of it currently being mined. These reserves equate to nearly 850 tonnes of gold, which at current production levels imply a lifespan of over 20 years left for gold mining bar any significant new discoveries. Burundi also has some gold reserves along with copper, cobalt, nickel and uranium deposits, though commercial extraction is also focussed on gold. Exploration activity in western Kenya has increased significantly over the past few years, with The East African writing in November 2011 that a "gold rush" is expected in the country within the next decade. Furthermore, Kenya's first ever large-scale mine – the Kwale mineral sands project – will commence production later this year.

Central and West Africa is increasingly being seen as boom areas for iron ore exploration and mining. Historians will point to the fact that current and short-term future activity is on such a scale that it reminds of colonial-era scurrying to exploit the region's minerals. Back then, as now, the area is seeing a significant increase in railway construction in order to ferry ore from the hinterland to ports – some of which will also be built from scratch. This revival in rail transport options has led to the opening of mines in Guinea, Liberia, Sierra Leone and elsewhere. JPMorgan Chase & Co estimates that some 4,900 km in new railways are being constructed while up to a dozen ports will be built in West Africa over the next decade. Ironically, the boom seen in the mineral sector comes off a relatively low base and is associated with a small mining sector. The Economic Community of West African States (ECOWAS) exported around $150bn worth of goods during 2011 of which three-quarters were petroleum and crude oil, with only 5% of export receipts generated by minerals (gold and diamonds in particular). The biggest challenges faced by the burgeoning mining sector is country-specific political risk (e.g. in Gabon and Guinea) and the opinion of some iron ore majors that mines in Australia and South Africa – who carry less political risk – can satisfy the world's appetite for iron.



Around 85% of global phosphate reserves are located in **North Africa** with Morocco the most important location of high-quality phosphate rock on the continent. The majority of the area's mined phosphates – which currently contribute around a quarter of world output – are used in the production of fertiliser. The political unrest seen in the region since the start of 2010 translated into a rise in rock prices as tracked in Casablanca and recorded by the World Bank. Prices have been elevated since then as unrest swept across the region and have yet to die down. The pricing outlook for phosphates is positive given the continued unrest in the Middle East & North Africa (MENA) region, miners and fertiliser producers in North America facing environmental challenges, as well as China more tightly controlling its exports. And, as noted by Frost & Sullivan's Chemicals, Materials & Food division, there is no effective substitute for this raw material when used for making fertiliser. Investors worldwide have been looking towards agriculture as a long-term rewarding investment due to the simple fact that the world population is growing and needs to be fed. Some astute investors have also realised the importance of North African phosphates in this view.

Chinese Demand & Investment

China accounted for almost 17% of the world's mineral imports by value last year. What might come as a surprising statistic is that only 16% of Africa's exported commodities by value were shipped to commodity-hungry China. The continent's largest export buyers in 2011 were China (16.4% of all exports by value), the US (15.9%), India (6.7%), Italy (6.5%), France (6.2%) and Spain (5.4%), followed by Germany, the United Kingdom and the Netherlands. China is the world's second-largest economy and has the largest import bill of all countries. It purchased $100bn worth of minerals during 2012 from 100 countries, including 23 African countries. The economic giant's purchases from Africa were dominated by base and precious metals as well as precious and semi-precious stones. But China is not just a buyer of Africa's resources; it is also a miner on the continent. Data limitations precludes a reliable estimate of how many African mines are operated by Chinese entities, according to the Open Society Initiative of South Africa (OSISA), though it is safe to say that most are centred on the SADC region. The frank questions being asked today is whether China is recolonising Africa; whether it is extracting natural resources for personal gain without contributing to the betterment of African communities? There is concern that some African governments give a free pass to Chinese companies and SOEs to mine minerals, export them without beneficiation, and then pack up and leave when the mines are exhausted. They also bring their own skilled and semi-skilled workers that are sometimes left behind when mines are shut. This picture is certainly not pretty, so why do African governments welcome Chinese mining with open arms?

The answer is not simple but often revolves around some of the benefits for Africa outside of the mining sector: Many Chinese mining companies have intricate relationships with engineering and construction counterparts back home – not least of all semi-state and public companies. This enables miners to build roads, construct schools and hospitals and provide other supportive infrastructure for both their own and African workers where mines are located. Their executives and home government are also not too concerned with local politics compared with Western investors. In fact, some of Africa's most unsavoury political regimes have good ties with Beijing due to a lesser amount of talk about politics and a greater focus on commodities. Another point to consider is the influx of Chinese retailers into thousands of African towns and cities that have been steadily growing over the past decade. While African might not always welcome these enterprises due to the price competition posed by Chinese imports, consumers are happy with the bargain prices offered on semi-durable and durable goods like clothing and appliances. International law firm Norton Rose commented late in 2012 that African governments are increasingly demanding more from Chinese investors by e.g. requiring that minerals be processed locally before being shipped to China.

Rising Resource Nationalism

So-called resource nationalism was a prominent news topic during 2012; becoming almost "contagious" as argued by Oxford Analytica. The term is defined as the drive by governments and communities to proclaim control over natural resources (and the benefits thereof) located within their sovereign borders. In Africa's context resource nationalism is a drive to increase the benefit obtained by Africans from minerals mined and exported often by foreign companies. The resurgence of this phenomenon is a result of several factors, including the achievement of a state-controlled Chinese economy; the success of state-owned companies like Brazil's Petrobras; expectations of a continued rise in commodity prices; and the shortcomings of capitalist / free-market philosophies seen in some countries guided by the Bretton Woods Institutions – the World Bank and International Monetary Fund (IMF). Resource nationalism is the primary risk for mining companies worldwide followed by skills shortages and infrastructure access. Recent incidences of this phenomenon have included the payment of increased royalties and/or mining taxes, mandated beneficiation and/ or export levies, as well as state ownership of resources. However, putting aside the financial costs of these trends, resource investors argue that there are positives involved in resource nationalism as well. For one, the risk that they pose to the supply chain in some extractive industries provide more of a price floor similar to the upward pressure on the oil price seen from geopolitical conflict in the Middle East.

Egypt's Sukari gold mine is 50% owned by Australian company Centamin and 50% owned by the Egyptian government, and exports from this mine have become an important foreign exchange earner for the country. In October 2012 an Egyptian administrative court ruled that Centamin's contract to exploit the mine was invalid after a number of deals – made under deposed President Hosni Mubarak – had been reviewed, with the government seizing assets that they found to have been awarded illegally or under a cloud of corruption. The court did however leave the door open for Centamin to appeal – which the company did, and it has been able to continue operations in the interim. It is unclear as yet whether Centamin is in the wrong; either way, it will make potential investors wary of investing in Egypt until there is certainty about the future direction of economic policy and its stance towards Mubarak-era investments. Although the seizing of assets linked to the Mubarak regime is not a structural policy switch toward nationalisation, it is still unnerving to investors and reflects the challenging business environment that Egypt still has.

Kenya legislated during October 2012 stipulations that foreign-owned mining companies applying for operating licenses in the country will in the future be required to have a minimum 35% local shareholding. The government stated that its intention was to leave behind a history of foreign companies obtaining 100% control of mineral resources without local companies and communities benefitting from mining. Also, by increasing investment and revenue value amongst companies domiciled in Kenya, the state is hoping to increase its tax revenues. The draft Geology, Minerals and Mining Bill of 2012 is also seeking to differentiate the royalties paid on different minerals which could translate into higher government receipts from gold and diamond operations. There is also a drive to see more mining companies list on the Nairobi Stock Exchange (NSE). The fact that large coal, oil and titanium discoveries were recent made in the country cannot be overlooked as the government looks to cash in on the mining sector.

South Africa's ruling African National Congress (ANC) resolved at its quinquennial national conference during December 2012 to support the introduction of a so-called "resource rent" tax on mining companies. The levy will be charged on companies making a significant return on their assets after a certain period of operation, thereby excluding smaller miners from this increase in taxes. The move to support this proposal comes at the end of ANC President Jacob Zuma's first term as the party's leader in which he has been criticised from almost every corner for being an ineffective leader in the government's drive to create jobs and reduce poverty. After several years of mining nationalisation talk by the ANC's youth wing, the more moderate "resource rent" idea is likely to gain traction during 2013. It will be the latest move to shore up tax revenues in the country whose counter-cyclical fiscal policy is being pressured by increasing demands from voters for more social expenditure.

Zimbabwe's economy was open to foreign investment during the 1980s and 1990s though took a turn for the worst with the government's land expropriation drive during the early 2000s. The mining sector experienced a decline in activity and investment leading up to the economic and political turnaround of 2008-09 followed by (limited) renewed interest from foreign capital. However, during September 2010 the Ministry of Youth, Empowerment and Indigenisation resurrected the Indigenisation and Economic Empowerment Act of 2007 which required foreign-owned companies to eventually have a majority local ownership. The state's first target was the big mining sector with its large offshore shareholding. The indigenisation process was much smoother and almost absent of the violence seen on farms some years earlier, and by the end of 2012 the vast majority of foreign-owned miners had reached deals with the government about selling / turning over 51% of equity to locals.

"The single most important thing that companies and senior executives need to do in order to manage their resource nationalism game is to act with respect. If they drop in on flying visits, and act like they have all the answers, and act like they don't think that they need to bother to show an understanding of local historical, cultural and political dynamics, they will fail, and end up as targets for endless value extraction until they eventually run away," commented Africa Business Communities' Isaac Twumasi-Quantus on the Business Fights Poverty website during January 2012. Dealing with resource nationalism requires a multi-faceted approach, including partnering with state-owned enterprises (SOEs) and local communities to ensure that the benefit of mining is transferred to citizens. Also required is convincing governments about the value of mining to the entire economy as well as encouraging direct public sector participation in mining projects.

AFRICAN MINING TOMORROW – OUTLOOK TOWARDS 2020

Future Demand from Key Trading Partners

Africa's export-oriented mining and quarrying is driven primarily by the commodity hunger of the world's largest economies. The world economy expanded by 4% p.a. during 2004-11 and is projected by the IMF to grow by almost 3.5% p.a. during 2012-13. A rosier outlook is pencilled in for 2014-20 with an average growth rate of 4.6% p.a. projected based on the multilateral organisation's latest World Economic Outlook. Of particular interest to African mining activities is the positive growth outlook for its key trading partners.

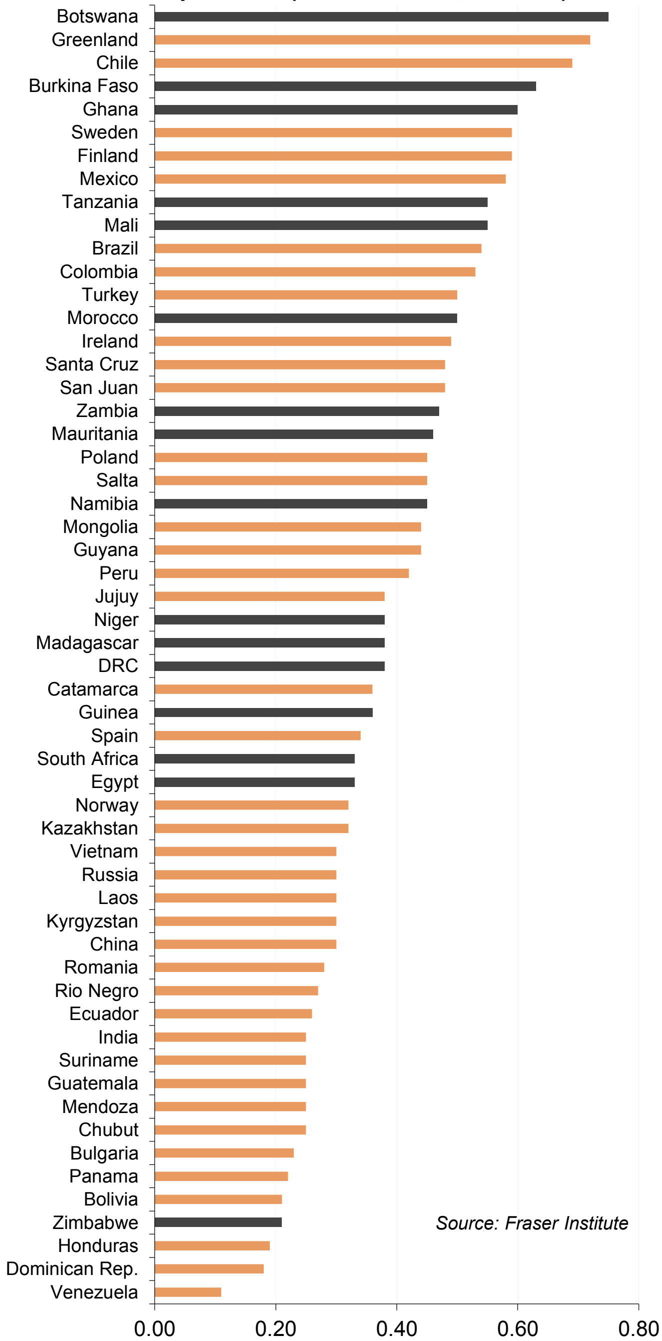
Real Economic Growth Outlook for Africa's Top Mineral Export Buyers

	1994 - 2003 avg.	2004-11 avg.	2012-13F avg.	2014-20F avg.
World	3.40	4.00	3.45	4.60
China	9.40	10.84	8.00	8.50
India	6.00	8.23	5.45	6.90
United Kingdom	3.50	1.19	0.35	2.70
Japan	0.90	0.60	1.70	1.10
US	3.30	1.50	2.15	3.30
Germany	1.50	1.45	0.90	1.30
Belgium	2.30	1.64	0.15	1.50
Turkey	2.70	5.38	3.25	4.40
Switzerland	1.30	2.24	1.10	1.90
Canada	3.50	1.83	1.95	2.30
Italy	1.70	0.25	-1.50	1.40

The preceding table indicates that the growth outlook towards 2020 is better than the current expansion in real GDP for all the continent's largest trading partners except Japan. (The key reason behind the world's third-largest economy having a better reading for 2012-13 is due to the reconstruction activity still on-going following the March 2011 earthquake and tsunami.)

There is broad agreement that the future of Africa's commodity boom will in part be dependent on China – who last year was the continent's largest buyer of mineral exports and also the fastest-growing amongst Africa's largest trading partners. At present, one in every six shipping containers exported from Africa's harbours is destined for ocean ports servicing Chinese imports. A 2010 study by the Reserve Bank of Australia (RBA) found that Chinese exports (largely manufactured goods) are a "sizeable and significant determinant" of the country's demand for resource commodities such as those produced by African miners. This suggests that the future of Africa's commodity exports to the East is tied to the outlook for Chinese exports going forward.

Current Regulations Supporting Mineral Exploration (Score out of 1; 1 = best)



In turn, a microeconometric study published in the European Journal of Development Research during 2008 indicated that major contributors to the increase in Chinese exports were "collaboration with foreign investors and fierce domestic competition". Considering these two elements:

- It is expected that collaboration with foreign investors into China will, at worst, remain unchanged, and may very well improve at a faster rate than before. Following their Central Economic Work Conference held in December, the Communist Party's top leaders issued a press release in which they pledged to "deepen reforms" and to "open [China] up more". It is true that there is a conservative faction in the Chinese government that opposes reform, but it seems that – as The Economist says – the election of the reform-minded Li Keqiang and the president-in-waiting Xi Jinping, as well as the attention given to their remarks about reform, "could be aimed at signalling a new resolve" to keep opening up the economy.

- A 2011 research survey found that Chinese manufacturing competitiveness is determined by 1) the cost and supply of labour; 2) state support for research and development, quality of infrastructure, as well as local business dynamics. The labour market issue is the only factor that could pose a challenge to factory sector competitiveness, with their demographic trends suggesting labour quality and availability in the labour-intensive consumer goods manufacturing industry being better than that of heavy industry towards 2020 while not as favourable as those of more technologically intensive sectors.

Geographical Bright Spots

Having argued that the outlook for demand of African minerals looks positive towards 2020 it is crucial to understand which African states are capable of capitalising on this scenario. Two key factors to consider are the general operating environment within the country as well as political risk factors. In the table on the next page is a selection of indicators that would pertain to an investment decision into an African country's mining sector. These are sourced from annual publications by the World Bank, Transparency International and the World Economic Forum. The list includes 34 countries (the selection is limited by data constraints), all of which have commercially viable minerals listed by the CIA.

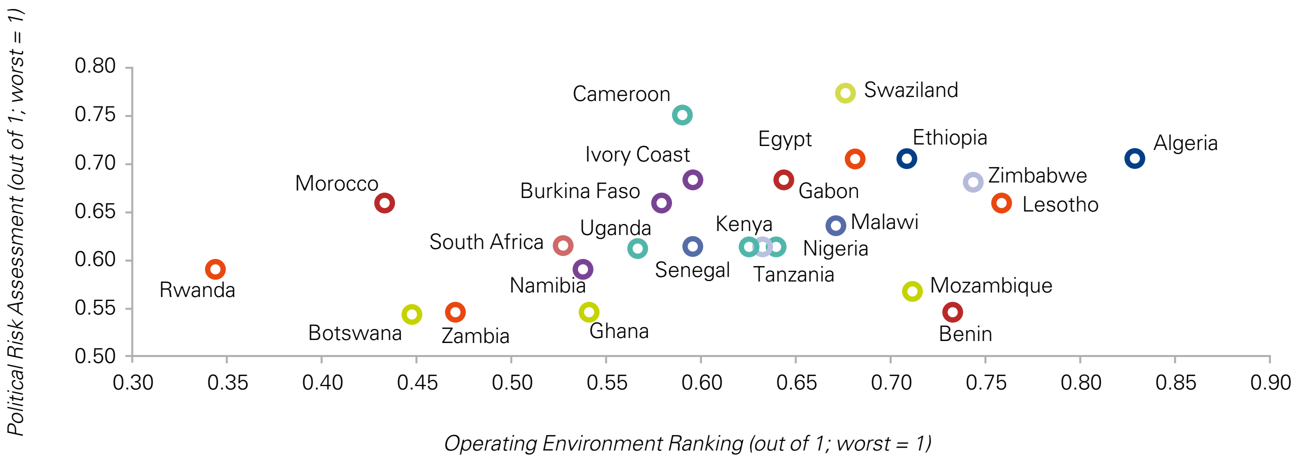
African Countries' Operating Environments																
Country	World Bank Doing Business Survey 2013 (out of 185)	Transparency International Corruption Perceptions Index 2012 (out of 176)	World Economic Forum (WEF) Global Competitiveness Index (GCI) 2012-13 (out of 144)												Score	Rank
			Government Interaction		Infrastructure		Investment & Trade				Labour Relations					
	Business regulations for local firms (out of 185)	Perceived levels of corruption	Favouritism in decisions of government officials	Burden of government regulation	Transparency of government policymaking	Quality of roads	Quality of railroad infrastructure*	Quality of port infrastructure	Prevalence of trade barriers	Business impact of rules on FDI	Burden of customs procedures	Business impact on HIV/ AIDS	Cooperation in labour-employmentrelations	Hiring and firing practices	Weighted score of survey rankings (out of 1)	Operating environment attractiveness ranking
Algeria	152	105	134	140	144	88	90	131	141	138	141	69	143	112	0.83	32
Benin	175	94	65	106	108	104	107	95	138	125	128	118	106	64	0.73	28
Botswana	59	30	29	43	43	55	55	97	42	49	54	136	113	123	0.45	4
Burkina Faso	153	83	90	49	60	125	92	103	90	48	83	109	95	32	0.58	11
Burundi	159	165	126	121	134	121	144	136	137	133	140	141	131	87	0.90	34
Cameroon	161	144	108	73	73	112	75	99	54	53	63	115	94	18	0.59	13
Cape Verde	122	39	49	38	58	65	144	85	121	83	116	88	110	99	0.58	12
Chad	184	165	124	95	138	103	144	130	135	129	139	138	132	23	0.85	33
Egypt	109	118	74	113	113	109	52	79	124	110	90	86	128	116	0.68	24
Ethiopia	127	113	71	63	129	64	112	110	143	114	125	126	100	81	0.71	25
Gabon	170	102	69	19	39	138	67	138	139	43	99	127	82	119	0.64	20
Ghana	64	64	78	66	90	85	104	76	83	74	115	120	76	30	0.54	9
Guinea	178	154	57	30	126	140	108	107	126	122	119	129	74	27	0.71	27
Ivory Coast	177	130	95	55	106	107	87	53	131	58	76	117	32	28	0.60	14
Kenya	121	139	120	74	105	72	72	91	105	90	109	130	77	11	0.63	17
Lesotho	136	64	118	100	135	111	110	114	129	93	110	140	121	96	0.76	31
Liberia	149	75	30	15	50	76	59	72	49	106	43	75	85	66	0.45	5
Madagascar	142	118	85	117	141	130	98	123	133	121	123	82	83	45	0.74	29
Malawi	157	88	101	79	103	89	84	94	87	107	121	143	91	58	0.67	22
Mali	151	105	93	56	117	82	61	74	117	103	70	121	78	77	0.62	16
Mauritania	167	123	140	24	131	119	91	98	43	112	75	97	138	29	0.66	21
Morocco	97	88	42	64	53	70	36	49	57	33	42	81	120	74	0.43	3
Mozambique	146	123	83	70	70	135	89	116	118	73	101	137	126	102	0.71	26
Namibia	87	58	88	68	85	35	39	27	77	84	82	142	116	130	0.54	8
Nigeria	131	139	122	36	63	114	95	106	108	86	94	114	115	17	0.64	19
Rwanda	52	50	5	2	7	40	144	109	60	18	6	122	40	59	0.34	1
Senegal	166	94	98	91	84	97	105	58	112	68	34	95	71	76	0.60	15
South Africa	39	69	110	123	35	42	46	52	39	61	56	135	144	143	0.53	7
Swaziland	123	88	111	99	132	47	48	68	97	98	135	144	102	117	0.68	23
Tanzania	134	102	56	58	93	94	82	117	122	50	113	131	101	70	0.63	18
The Gambia	147	105	17	12	44	51	144	47	44	28	25	96	24	40	0.39	2
Uganda	120	130	113	40	59	110	111	90	93	31	64	132	86	7	0.57	10
Zambia	94	88	68	21	46	96	80	70	67	37	62	139	88	31	0.47	6
Zimbabwe	172	163	117	107	72	95	76	61	45	143	111	133	122	140	0.74	30
Weighting	8%	8%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%		

Sources: World Bank, Transparency International, WEF, CIA, NKC Research

* Countries with railroad infrastructure of less than 50 km are not evaluated by the WEF GCI. We have assigned a default 144th position ranking for these economies within this category.

The indicators selected for this table are relevant to large-scale investments in labour-intensive extractive industries where government regulation is most often quite rigorous. They include considerations about government interaction, infrastructure quality, investment and trade regulations, as well as labour relations. The countries' rankings in the different publications are weighed to determine a score for the quality of a particular jurisdiction's operational environment from a mining investor's perspective. A score between zero and one is possible where the lowest reading is the most favourable; the countries are ranked according to this quantitative assessment with the top 10 performers highlighted. This assessment provides a list of countries that could have a favourable operating environment for mining firms. In the following graph, the above table's findings are combined with NKC Independent Economists' political risk scores for African states. Both the operating environment and political risk evaluation produces quantitative assessments between zero and one, with a lower reading being better.

Potential African Mining Destinations



Botswana – Debswana (a joint venture between De Beers and the Botswana government) along with Russia's state-owned ALROSA produce around three-quarters of world diamond production. Botswana is the largest diamond miner by value in the world and sources 70% of its export receipts and 40% of state revenues from this resource. Aside from the country's well-known diamond reserves, coal production is likely to become of increasing value to Botswana following the lifting of a moratorium on new prospecting licences for coal, coal-bed methane and related minerals in 2011.The Coal Road Map unveiled in 2011 is a strategic plan to plot development of the coal sector through 2018 and beyond. The country is estimated to have more than 200 billion tonnes of coal reserves - much of which are untapped. Recognising this potential, and that the coal sector could be the most propitious new export sector and a potential substitute for Botswana's diamond revenue in time, development of the coal sector has become a key priority.

Ghana – Gold is by far the most important mineral in the small mining sector. Foreign-owned firms dominate the country's mining landscape with many of the largest companies having links to South Africa, the United Kingdom and China. Ghana is the second-largest gold producer on the continent after South Africa, and the outlook for production growth over the long-term is very favourable (as opposed to a more lacklustre future for Africa's largest economy). During December 2012 Moody's Investor's Service assigned Ghana a sovereign risk rating of "B1" with one of the main drivers of the assessment being robust economic growth prospects on the back of foreign investment in gold mining, petroleum and gas sectors. Companies including Perseus Mining Ltd. and Endeavour Mining Corporation invested $2bn in Ghanaian gold mines during 2011-12, according to the Ghana Minerals Commission.

Mozambique – The mining sector's contribution to overall economic activity is expected to increase significantly over the medium- to long-term on the back of a sharp projected increase in coal production. The Mozambican government is hoping for an increase in the sector's contribution to 12% of GDP by 2015 compared to just 2% during 2012. According to the IMF, megaprojects (including coal and gas production) have the potential to make a contribution of 18% of total value added in the economy by 2016, and to boost economic growth by two to three percentage points each year. (During 2003-10, megaprojects contributed some four percentage points to the growth in total value added in the economy.) Coal production in Mozambique could reach beyond 100 million tonnes p.a. within the next five years from less than 40,000 tonnes p.a. over the past decade.

Namibia – Mineral exports constitute almost half of the country's total export earnings, with the country producing diamonds, uranium, copper, magnesium, zinc, silver, gold, lead, semi-precious stones and industrial minerals. Namibia is the fourth-largest exporter of non-fuel minerals in Africa, with this category contributing around half of all exports over the past decade. Research and Markets believes that Namibia's mining sector will post a real expansion of 12.5% p.a. towards 2017 despite a decline in uranium prices during 2011-12 leading to the delay in launching several uranium projects in the country. The organisation believes that the Namibian mining sector's strong performance over the past two decades is definitely sustainable thanks to the positive outlook for diamond mining. They expect carat production to rise by 9.1% p.a. over the next five years.

Tanzania – The mining industry remains relatively small but it is exceedingly important as a significant source of the country's export revenues. The mining sector contributed approximately 3.2% to GDP in 2012 while the government wishes to expand this to 10% by 2025. In the government's estimates, about 90% of Tanzania's minerals – including gold, diamonds and gemstones – are yet to be exploited. The country has for a long time now been a significant producer of gold and diamonds, but exploration has also been conducted in nickel, uranium and oil and natural gas. Construction of a nickel mine is set to start in 2014 while production should commence some two years later. Furthermore, large-scale commercial uranium mining is likely to commence over the coming years as well. In addition, Tanzania's industrial growth could be boosted significantly by coal mining over the long-term as the country increases its reliance on coal-fired power stations.

Zambia – The landlocked country has a wide spectrum of mineral resources which spans a range of metals including copper, cobalt, zinc, gold, manganese, nickel and gemstones. There is also a variety of industrial metals. Despite this wealth however, the economy remains dependent on the extraction and processing of copper and, to a lesser extent, cobalt for export, which remain the country's largest industry. Combined copper and cobalt account for approximately 10% of GDP and around 80% of export receipts. The country witnessed a decline in copper production during the 1990s followed by a recovery over the past decade, with the positive performance expected to continue over the long-term. The sector is anticipated to expand by 2% - 4% p.a. over the next five years and reach above one million tonnes p.a. by 2015. A positive factor for investors and mining companies is the government's recent decision not to reintroduce a windfall tax on mining companies' profits.

The above assessment of investment destinations is however not the alpha and omega of Africa's mining future. Other countries not included but which may provide investment opportunities include:

- **Angola** – The production of copper and iron ore was interrupted during the civil war, and is yet to resume. The provinces of Kwanza Norte and Huila appear to be the most attractive for iron ore mining. The Angolan government is hoping to generate enough local and foreign investment to set up smelters for the production of steel and iron alloy.
- **Cameroon** – Diamond production is currently dominated by artisanal miners though the government hopes that industrial diamond output will soon increase significantly, as Botswana Diamonds and C&K Mining start to unearth diamonds in the country. Bauxite reserves (the main source of aluminium) is estimated at one billion tonnes.
- **DRC** – Mining has been the main pillar of the economy since colonial times, and still accounts for around 80% of export earnings. In recent years the mining sector has become an integral and increasingly important part of the economy despite the country's relatively high levels of political risk. The local mining industry is seen as amongst the most attractive in Africa due to the vast volume of mineral resources in spite of the difficult operating environment. The DRC is the third largest diamond producer in the world by volume and most diamonds are produced by small-scale artisanal miners. Elsewhere, Randgold and AngloGold Ashanti's Kibali gold project – which is thought to be one of the largest goldfields in Africa with 10.2 million ounces – is scheduled to start production in 2013. The project is one of several that are due to either commence or expand over the next three years as the country's copper and gold sectors expand rapidly. It is possible for the mining sector to grow by 12% p.a. during 2013-16, largely driven by the very positive outlook for precious and base metal production.
- **Kenya** – Australia's Base Resources could start producing and exporting rutile, zircon and ilmenite when Kenya's first ever large-scale mine commences production in Q3 of 2013. The mine is expected to produce 80,000 tonnes of rutile per year – representing 14% of the world's annual supply – in addition to 330,000 tonnes of ilmenite and 40,000 tonnes of zircon, when it is fully operational. Kenya's output from the Kwale mineral sands mine at the coast is expected to triple the country's mining export revenues and is projected to overtake export earnings from coffee, which brings in about $200m p.a.
- **Liberia** – Gold deposits lie in one of the last unexplored sections of the Birimian craton, which is the world's second largest gold producing region and stretches across Ghana, Ivory Coast, Guinea, Mali and Burkina Faso.
- **Mali** – Some estimates point at Africa's fourth-largest gold producer exhausting its gold ore within the next decade. Operations have recently been impacted by the political crisis that has seen Islamist rebels take control of the north of the country. Although gold reserves are concentrated in the southwest, there have been doubts over government stability since the April 2012 coup.

- **Rwanda** – Investment in the mining sector increased from $24m in 2011 to $69.9m in 2012. The investments came in the form of 14 mining projects with the largest including gold exploration and wolfram concessions. With 57.1% of mining projects registered last year being owned by foreign investors and a further 21.4% being joint ventures between foreign and local investors, Rwanda has recently seen a significant increase in foreign direct investment into the mining sector. This progression can be attributed to Rwanda's adherence to all the international regulations required for mineral exports, which has increased investor confidence in the area. The various concessions also indicate a desire to diversify the export market.
- **Sierra Leone** – The IMF estimated in 2011 that the country could export around 35 million tonnes of iron ore in the medium-term, which is believed to be a conservative estimate. Output could in fact be as much as between 45 million tonnes and 75 million tonnes annually over the next decade, if potential reserves are fully exploited.

CONCLUSIONS

Africa mining industry is centuries old, and its outlook continues to be bright. The continent's regional distribution of key minerals focusses precious metals in Southern, West and East Africa, iron ore in Central and West Africa, as well as phosphates in North Africa. Chinese demand for African commodities and investments from the world's second-largest economy continues to grow largely due to the Chinese attitude of limited political interference as well as value-added investments (e.g. the building of hospitals) associated with mining projects. Resource nationalism – a drive to obtain more benefit from resources for local communities and governments – has also become more critical issue and is seen as a primary concern for potential mining investors. However, the fact remains that the largest buyers of Africa's exported minerals have a positive economic growth outlook towards 2020, with China being a particularly bright prospect. The operational environment and political risk assessments included in this report identify Botswana, Ghana, Mozambique, Namibia, Tanzania and Zambia as very attractive destinations for mining investment. Other countries that also warrant consideration include Angola, Cameroon, the DRC, Kenya, Liberia, Mali, Rwanda and Sierra Leone.

African Countries' Commercially Viable Mineral Resources	
COUNTRY	MINERALS
Algeria	iron ore, phosphates, uranium, lead, zinc
Angola	diamonds, iron ore, phosphates, copper, feldspar, gold, bauxite, uranium
Benin	limestone, marble
Botswana	diamonds, copper, nickel, salt, soda ash, potash, coal, iron ore, silver
Burkina Faso	manganese, limestone, marble; small deposits of gold, phosphates, pumice, salt
Burundi	nickel, uranium, rare earth oxides, peat, cobalt, copper, platinum, vanadium, niobium, tantalum, gold, tin, tungsten, kaolin, limestone
Cameroon	bauxite, iron ore
Cape Verde	basalt rock, limestone, kaolin, clay, gypsum
Central African Republic	diamonds, uranium, gold
Chad	uranium, natron, kaolin, gold, limestone, sand and gravel
Congo Brazzaville	timber, potash, lead, zinc, uranium, copper, phosphates, gold, magnesium
Djibouti	gold, clay, granite, limestone, marble, salt, diatomite, gypsum, pumice
DRC	cobalt, copper, niobium, tantalum, industrial and gem diamonds, gold, silver, zinc, manganese, tin, uranium, coal
Egypt	iron ore, phosphates, manganese, limestone, gypsum, talc, asbestos, lead, rare earth elements, zinc
Equatorial Guinea	gold, bauxite, diamonds, tantalum, sand and gravel, clay
Eritrea	gold, potash, zinc, copper, salt, possibly oil and natural gas, fish
Ethiopia	small reserves of gold, platinum, copper, potash
Gabon	diamond, niobium, manganese, uranium, gold
Ghana	gold, industrial diamonds, bauxite, manganese, silver, limestone
Guinea	bauxite, iron ore, diamonds, gold, uranium
Ivory Coast	diamonds, manganese, iron ore, cobalt, bauxite, copper, gold, nickel, tantalum
Kenya	limestone, soda ash, gemstones, fluorspar, zinc, diatomite, gypsum
Lesotho	diamonds, sand, clay, building stone
Liberia	iron ore, diamonds, gold
Libya	gypsum
Madagascar	graphite, chromite, coal, bauxite, rare earth elements, quartz, tar sands, semiprecious stones, mica
Malawi	limestone, unexploited deposits of uranium, coal, and bauxite
Mali	gold, phosphates, kaolin, limestone, uranium, gypsum, granite
Mauritania	iron ore, gypsum, copper, phosphate, diamonds, gold
Morocco	phosphates, iron ore, manganese, lead, zinc
Mozambique	coal, titanium, tantalum, graphite
Namibia	diamonds, copper, uranium, gold, silver, lead, tin, lithium, cadmium, tungsten, zinc
Niger	uranium, coal, iron ore, tin, phosphates, gold, molybdenum, gypsum
Nigeria	tin, iron ore, coal, limestone, niobium, lead, zinc
Rwanda	gold, cassiterite (tin ore), wolframite (tungsten ore)
Senegal	phosphates, iron ore
South Africa	gold, chromium, antimony, coal, iron ore, manganese, nickel, phosphates, tin, rare earth elements, uranium, gem diamonds, platinum, copper, vanadium
South Sudan	gold, diamonds, limestone, iron ore, copper, chromium ore, zinc, tungsten, mica, silver
Sudan	small reserves of iron ore, copper, chromium ore, zinc, tungsten, mica, silver, gold
Swaziland	asbestos, coal, clay, cassiterite, small gold and diamond deposits, quarry stone, and talc
Tanzania	tin, phosphates, iron ore, coal, diamonds, gemstones, gold nickel
The Gambia	clay, silica sand, titanium (rutile and ilmenite), tin, zircon
Tunisia	phosphates, iron ore, lead, zinc, salt
Uganda	copper, cobalt, limestone, gold
Zambia	copper, cobalt, zinc, lead, coal, emeralds, gold, silver, uranium
Zimbabwe	coal, chromium ore, asbestos, gold, nickel, copper, iron ore, vanadium, lithium, tin, platinum group metals
Source: CIA World Factbook	

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