



2013 Minerals Yearbook

AFRICA SUMMARY

THE MINERAL INDUSTRIES OF AFRICA

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The 57 independent nations and other territories of continental Africa and adjacent islands covered in this volume encompass a land area of 30.3 million square kilometers, which is more than three times the size of the United States, and were home to 1.11 billion people in 2013. Nigeria had a population of 174 million in 2013; Ethiopia, 94.1 million; Egypt, 82.1 million; the Democratic Republic of the Congo [Congo (Kinshasa)], 67.5 million; and South Africa, 53 million (table 1). For many of these countries, mineral exploration and production constitute significant parts of their economies and remain keys to future economic growth. Africa is richly endowed with mineral reserves and ranks first or second in quantity of world reserves of bauxite, chromite, cobalt, industrial diamond, manganese, phosphate rock, platinum-group metals (PGMs), rutile, soda ash, and zirconium (Bedinger, 2015a, b; Bray, 2015; Corathers, 2015; Dolley, 2015; Jasinski, 2015; Loferski, 2015; Olson, 2015; Papp, 2015; Shedd, 2015).

The mineral industry was an important source of export earnings for many African nations in 2013. To promote exports, groups of African countries have formed numerous trade blocs, which included the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), the Mano River Union, the Southern African Development Community (SADC), and the West African Economic and Monetary Union (UEMOA). Algeria, Angola, Libya, and Nigeria were members of the Organization of the Petroleum Exporting Countries (OPEC). The African Union, which had 54 African countries as members, was formed to accelerate socioeconomic integration and promote peace, security, and stability on the continent.

The U.S. Geological Survey (USGS) acknowledges and expresses its sincere appreciation to the following Government agencies, international institutions, and private research organizations for providing mineral production statistics, basic economic data, and mineral exploration and other mineral-related information:

For mineral production statistics—

- Algeria—Ministry of Energy and Mines,
- Angola—Ministry of Geology and Mines,
- Burkina Faso—Ministry of Mines and Energy,
- Kenya—Ministry of Mining,
- Malawi—Department of Mines,
- Mauritius—Statistics Mauritius,
- Mozambique—National Directorate of Mines,
- Niger—Ministry of Mines and Industrial Development,
- Seychelles—Seychelles Energy Commission,
- South Africa—Department of Mineral Resources,
- Swaziland—Central Statistical Office,

- Tanzania—Ministry of Energy and Minerals,
- Togo—General Directorate of Statistics and National Accounting,

- Tunisia—National Institute of Statistics, and
- Zimbabwe—Minerals Marketing Corporation.

For basic economic data—the International Monetary Fund.

For mineral consumption data—

- BP p.l.c.,
- International Nickel Study Group,
- World Bureau of Metal Statistics, and
- World Steel Association.

For exploration and other mineral-related information—Metals Economics Group (MEG) in Canada.

General Economic Conditions

In 2013, the real gross domestic product (GDP) of Sub-Saharan Africa increased by 5.1%; the GDP increased in Morocco by 4.4%; Algeria, 2.8%; Tunisia, 2.3%; and Egypt 2.1%. Libya's GDP decreased by 13.6% in 2013 (table 2). The worldwide GDP increased by 3.3% in 2013. The average GDP growth rate in Sub-Saharan petroleum-exporting countries was 5.7%; in low-income petroleum-importing countries, 6.1%; and in middle-income petroleum importing countries, 3.5%. In Sierra Leone, the GDP increased by 20.1% in 2013, mainly because of increased iron ore production. South Sudan's GDP increased by 27.1% in 2013 because of the resumption of crude petroleum production in April. In Libya, the decrease in the GDP was attributable to disruptions to crude petroleum production (International Monetary Fund, 2014, p. 65, 184, 189–190).

GDP growth in African petroleum-exporting countries is projected to be at or about 5.1% in 2014 and 5.8% in 2015. In low-income petroleum-importing countries, GDP growth is expected to be at or about 6.3% in 2014 and 6.6% in 2015. GDP growth is likely to be at or about 3% in 2014 and 3.6% in 2015 in middle-income petroleum-importing countries. South Sudan's GDP is expected to decrease by 12.3% in 2014 because of disruptions to petroleum production resulting from the civil war that started in December 2013 (International Monetary Fund, 2014, p. 65, 190).

Investment Data

In South Africa, numerous producers are planning new mines and plants and capacity expansions of existing operations for andalusite, cement, chromite, coal, diamond, ferrochromium, ferromanganese, ferrovandium, fluorspar, gold, iron ore, manganese ore, pig iron, phosphate fertilizers, PGMs, rare-earth elements, silicomanganese, titanium metal, uranium, vanadium, zinc, and zirconium metal. In 2013, the estimated costs of newly committed mineral projects was \$18.7 billion, of which PGM

¹Deceased.

projects accounted for 38.3%; processed minerals, 17.8%; gold, 4.2%; and other unprocessed minerals, 39.7% (Mwape and others, 2015, p. 33).

In Tanzania, the estimated capital cost of a proposed liquified natural gas project was between \$10 billion and \$16 billion. For the Kamao copper project in Congo (Kinshasa), capital costs in the first phase of the project were estimated to be \$1.4 billion, and in the second phase, an additional \$3.5 billion. The estimated capital cost of the Zambeze coal project in Mozambique was \$3.3 billion. A proposed petroleum refinery in Uganda had an estimated cost of \$2.5 billion (Brower, 2013; Engineering & Mining Journal, 2013; Northern Miner, The, 2013; Quinlan, 2013).

Legislation

In July 2010, the U.S. Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), which contains provisions concerning the use of minerals to finance armed groups in eastern Congo (Kinshasa). The U.S. Securities and Exchange Commission (SEC) issued regulations in final form in accordance with the Dodd-Frank Act in August 2012 (U.S. Securities and Exchange Commission, 2012, p. 56274–56275).

Under the regulations, all companies registered with the SEC that sell products containing gold, tantalum, tin, or tungsten are required to disclose whether these minerals originated from Congo (Kinshasa) or adjoining countries. Companies that sell products containing gold, tantalum, tin, or tungsten that originated in Congo (Kinshasa) or adjoining countries are also required to submit annual reports to the SEC describing the due diligence measures taken to determine the source and custody of such minerals and to provide a description of the products manufactured or contracted to be manufactured that are not conflict-free. The reports also are required to be published on the companies' Web sites (U.S. Securities and Exchange Commission, 2012, p. 56274).

In December 2010, the Government of Rwanda and the International Tin Research Institute Ltd. (ITRI) started the ITRI Tin Supply Chain Initiative (iTSCI) certification scheme for domestically produced tantalum, tin, and tungsten to meet end users' requirements of the Dodd-Frank Act. By the end of 2013, 224 mining companies that operated 638 mine sites were participating in the iTSCI. In July 2013, ITRI started a mineral-sampling program at numerous mine sites; 324 out of the planned 480 samples were collected by yearend (International Tin Research Institute, Ltd., 2014b).

In March 2011, the government of Katanga, which is a Province of Congo (Kinshasa), and ITRI started the implementation of iTSCI in the Province. By the end of 2012, 140 mine sites were covered by the scheme in Katanga Province. By the end of 2013, the iTSCI program had been implemented in 27 subsectors in the Kailo Territory and the Pangi Territory in Maniema Province. In December, a feasibility study on expanding the program to Punia Territory in Maniema Province was completed with favorable results. The program was expected to commence in Punia Territory in January 2014 (International Tin Research Institute, Ltd., 2013, 2014a).

In 2013, the Government of Burundi was engaged in a pilot program to implement a system established by the

International Conference on the Great Lakes Region (ICGLR) to certify and trace domestically mined cassiterite, columbite-tantalite, and gold because of the conflict minerals issue in Congo (Kinshasa) (Levin and Cook, 2013, p. 18).

In 2013, the Government of Congo (Kinshasa) was considering a new mining code that would increase its free-carried and nondilutable share in mining projects to 35% from 5%. The proposed mining code would increase royalty rates on precious metals to 6% from 2.5%, and on nonferrous metals, to 6% from 2%. Exploration permits would be reduced to 6 years from 15 years. The proposed mining code would not be submitted for approval by the Congolese Parliament before the first quarter of 2014 (Engineering & Mining Journal, 2014).

In April 2013, the Government of Congo (Kinshasa) issued a decree that banned the export of cobalt and copper concentrates. Companies were given a 90-day moratorium to comply with the ban; the moratorium subsequently was extended until yearend (Engineering & Mining Journal, 2014).

In October 2013, the Government of Burundi passed the Mining Code of Burundi (Law No. 1/21 of October 15, 2013), which partially replaced the Mining and Petroleum Act of 1976 (Decree-Law No. 1/138 of July 17, 1976). The exploration for and mining of minerals and mineral fuels other than petroleum and natural gas were governed by the Mining Code of Burundi. At yearend, the natural gas and petroleum subsector still was governed by the Mining and Petroleum Act of 1976 (Karerwa, 2013).

Burundi's Mining Code set *ad valorem* royalty rates on mining companies with exploitation licenses at 7% for gemstones, 5% for precious metals, 4% for basic metals, and 2% for other minerals. *Ad valorem* royalty rates on quarries, artisanal miners, and authorized mineral traders were set at 3% for base metals, 2% for precious metals, 2% for gemstones, and 1.5% for other minerals (Karerwa, 2013).

The Mining Code also required a simplified environmental impact study to be conducted for prospecting, exploration, artisanal mining, and quarrying licenses to be awarded and a full environmental impact study for exploitation licenses to be awarded. Companies holding exploitation licenses were also required to allow the Government to hold at least a 10% share in their Burundian operations (Karerwa, 2013).

The Government attempted to formalize the artisanal mining sector in Burundi by mandating in the Mining Code that all artisanal miners have a mining license. In March 2013, the Government also imposed a 2-month mining ban on artisanal mining in an attempt to formalize the artisanal mining sector (United Nations Group of Experts, 2013, p. 35; U.S. Embassy, Bujumbura, Burundi, 2014).

The petroleum and natural gas subsector of Uganda was governed by the Petroleum (Exploration, Development, and Production) Bill 2012 (the Upstream Act) and the Petroleum (Refining, Gas Processing, Transportation, and Storage) Act 2012 (the Midstream Act). The Upstream Act and the Midstream Act, which replaced the Petroleum (Exploration and Production) Act of 1985, were enacted into law in March 2013 and July 2013, respectively. The laws established a competitive bidding process for licenses in the upstream natural gas and petroleum subsector, the Petroleum Authority to advise

the Government and implement its regulations, and a national oil company to manage the Government's commercial interests in natural gas and petroleum. Production-sharing agreements would have a Government interest of between 15% and 20% (Mosbacher, 2013; Wass and Musiime, 2013, p. 17–18).

Unlike many other countries, the Government of Guinea amended its mining code to reduce some taxes in order to improve its investment climate. Mining profit taxes on most mineral commodities were reduced to 30% from 35%, and the tax on bauxite was reduced to 0.15% from 0.55% of the international price for aluminum (Thomson Reuters, 2013).

In May 2012, Ethiopian production of columbite-tantalite was suspended because of Government plans to stop exporting unprocessed concentrates and to focus on building a new plant for downstream processing. The Government lifted the ban on concentrate exports in 2013 (Araya, 2013).

In August 2013, the Government of Kenya canceled all exploration, mining, and prospecting licenses issued between January 15, 2013, and May 15, 2013, because the licenses reportedly were issued without proper documentation. A total of 43 licenses were revoked. The Government also increased royalty rates on niobium, rare earths, and titanium minerals to 10% from 3%; on coal, to 8% from 4%; and on gold, to 5% from 2.5% (Jiwaji, 2013; Metal Bulletin, 2013; Kushner, 2014).

The Government of Zimbabwe approved a policy banning alluvial mining near bodies of water and canceled all existing exploration permits in these areas. Local governments will be responsible for ensuring compliance with the Government's ban (Hall, 2014). The Government also announced plans to ban exports of raw platinum. The metal is currently shipped for refining in South Africa (Njanji 2014).

In Tanzania, large foreign mining companies will need to procure at least 80% of goods and services from local businesses by 2015. The Government of Namibia placed a moratorium on planned marine phosphate mining off the coast of Namibia until an environmental impact assessment was performed and demonstrated that mining would not harm the country's fishing industry (Ernst & Young Global Ltd., 2013, p. 3; Kaira, 2013).

Exploration

Exploration activity, as defined by African exploration budgets reported by SNL Metals & Mining (SNL), decreased to about \$2.4 billion in 2013 from about \$3.4 billion in 2012 (SNL Metals Economic Group, 2013). Based on site data compiled by the USGS, active gold and silver projects in 2013 accounted for approximately 48% of the reported African exploration projects; base metals, about 16%; iron ore, about 12%; PGMs, about 6%; diamond and uranium, about 4% each; and other minerals, about 10%. Early-stage exploration projects accounted for about 70% of the 2013 activity; producing projects, about 16%; feasibility-stage projects, about 11%; and developing projects, about 3%.

African exploration activity, expressed in terms of the number of active sites, decreased to 331 sites in 2013 from 471 sites in 2012. Exploration was focused primarily in, in descending order based on the number of sites, South Africa (60 sites), Burkina Faso (28 sites), Congo (Kinshasa) (26 sites), Ghana (21 sites), Tanzania (20 sites), Mali and Namibia (18 sites each),

Zambia (16 sites), Ivory Coast (11 sites), and Guinea and Sierra Leone (10 sites each). Activity also took place at 93 sites in 22 other countries. Table 3 highlights exploration information for 18 selected sites.

Exploration activity in Africa in 2013 varied as recent discoveries and improved investor interest stimulated activity in some areas, whereas factors that affect mineral supply, such as labor issues and regional unrest, limited interest and activities in other areas. The level of investor interest was also affected by the amount and cost of infrastructure in some areas. Issues of concern included artisanal mining, conflict minerals, employment, Government pressures, and political instability (Hall, 2012). For example, ongoing conflict in Sudan and South Sudan restricted mineral exploration activity. Also, mining-related tax increases were implemented or proposed in Congo (Kinshasa), Ghana, and Mozambique, and a new mining code was approved in Burundi in 2013 (Ernst & Young Global Ltd., 2013).

Interest in exploring for African mineral resources continued at a reduced level as exploration companies of all sizes reduced their exploration budgets in 2013. The limited amount of financing available forced many junior companies to limit their focus on selected projects. In spite of these issues, a survey of institutional investors conducted by the Economist Intelligence Group Ltd. found that two-thirds of the respondents listed Africa as having the greatest opportunity for investment of global frontier markets in spite of its macroeconomic and political risk (Economist Intelligence Group Ltd., 2012, p. 7).

Commodity Overview

In tables 5 through 20, estimates for the production of major mineral commodities for 2016 and beyond have been based upon supply-side assumptions, such as announced plans for increased production, new capacity construction, and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the historic data are estimated or reported, and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current (2013) producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within indicated time frames. Forward-looking information, which includes estimates of future production, exploration and mine development, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will take place.

Metals

Aluminum and Bauxite and Alumina.—*Production.*—African bauxite production increased by about 5% in 2013

compared with that of 2012. In 2013, increased output at the Sangaredi Mine more than offset the closure of the Friguia Mine in Guinea. In Ghana, production increased at the Awaso Mine. Output decreased at the Sierra Minerals Mine in Sierra Leone. Guinea accounted for about 92% of African bauxite production in 2013; Ghana, more than 4%; and Sierra Leone, about 3% (table 5). In 2013, Africa's share of world bauxite production was 7% (table 4).

African production of refined aluminum increased by more than 8% in 2013. Increased production at the Hillside smelter in South Africa more than offset decreased production from the Ikot Abasi smelter in Nigeria. Output also increased in Cameroon. South Africa accounted for about 40% of African aluminum output in 2013; Mozambique, 28%; and Egypt, 26% (table 6). Africa accounted for 4% of the world's aluminum production in 2013 (table 4).

Consumption.—In 2013, world primary refined aluminum consumption increased to 46.6 million metric tons (Mt) from 45.6 Mt in 2012. Africa's primary refined aluminum consumption decreased to 836,900 metric tons (t) in 2013 from 900,400 t in 2012 (Metal Bulletin, 2014a, b).

Outlook.—African bauxite production is likely to increase by an average of about 18% per year from 2013 to 2020. Most of the increase would be attributable to Guinea, where the Dian-Dian and the F.A.R. projects were expected to start in 2016, and the GAC Mine, by 2018. Output from the Sierra Minerals Mine in Sierra Leone also could increase by 2016 (table 5).

The production of refined aluminum is expected to decrease by 6% by 2016 and subsequently to remain unchanged until at least 2020. Output is likely to decrease in South Africa with the closure of the Bayside smelter (table 6).

Cobalt.—**Production.**—In 2013, African cobalt mine production increased by about 15% compared with that of 2012. Increased production in Congo (Kinshasa) was mostly attributable to the Mutanda and the Tenke Fungurume Mines. Production increased at the Ambatovy nickel-cobalt mine in Madagascar and at the Nkomati Mine in South Africa. In 2013, Congo (Kinshasa) accounted for 83% of African cobalt mine production; Zambia, 7%; and South Africa, 4% (table 7). Africa's share of world cobalt mine production was 63% in 2013 (table 4).

Outlook.—African cobalt mine production is expected to increase by an average of 4% per year from 2013 to 2020. Congo (Kinshasa) is likely to account for most of the increase in output because of the expansion of the Etoile, the KOV, the KTO, and the Mutanda Mines. Production is expected to increase at the Tenke Fungurume Mine and to decrease at the Mukondo Mountain Mine. In Madagascar, the Ambatovy Mine and refinery planned to reach 90% of capacity in 2016. In Burundi, the Musongati nickel mine could start production in 2015 and reach full capacity by 2020. Output is also likely to increase in South Africa and Zambia (table 7).

Copper.—**Production.**—Africa's copper mine production increased by nearly 27% in 2013 compared with that of 2012. In 2013, Congo (Kinshasa) accounted for nearly 50% of African copper mine production; Zambia, 39%; and South Africa, 4% (table 8). Africa's share of world copper mine

production was 11% in 2013 (table 4). The production increase in Congo (Kinshasa) was attributable to increased output at numerous mines, including the Dikulushi, the Kinsevere, the Kipoi, the KOV, the KTO, the Mutanda, the Mukondo Mountain, the T17, and the Tenke Fungurume Mines. Mining restarted at the Frontier Mine in 2013. In Zambia, output increased at the Kansanshi, the Lubambe, and the Nkana Mines. In Botswana, increased production at the Boseto and the Thakudu Mines more than offset decreased production from the Phoenix Mine. Mining from a copper-rich zone at the Bisha Mine in Eritrea started in 2013. In South Africa, output decreased at the Palabora Mine.

In 2013, Congo (Kinshasa) accounted for 51% of African refined copper production; Zambia, 42%; and South Africa, 6% (table 9). In Congo (Kinshasa), production increased at the Kinsevere, the Luilu, the Luita, the Mutanda, and the Tenke Fungurume solvent extraction/electrowinning plants. Output also increased in South Africa and Zambia. Egypt was the only producer of secondary refined copper in Africa; primary production accounted for most African production.

Consumption.—In 2013, world refined copper consumption increased to 21.3 Mt from nearly 20.1 Mt in 2012. Africa's refined copper consumption increased to 247,000 t in 2013 from 244,900 t in 2012 (Karpel, 2014; Pinkham, 2015).

Outlook.—African copper mine production is expected to increase by an average of about 6% per year from 2013 to 2020. Zambia's output is likely to nearly double because of increased output from the Kansanshi, the Konkola, and Lubambe Mines and the opening of the Sentinel Mine. In Congo (Kinshasa), expansions were planned at the Etoile Mine by 2016, and at the KOV, the KTO, and the T17 Mines, from 2013 to 2020. Other contributions to increased national production of mined copper would include the opening of the Kapulo and the Kamoia Mines in 2015 and 2019, respectively, and increased output from the Mutanda Mines (table 8).

Mining from a copper-rich zone at the Bisha Mine in Eritrea was planned from 2014 to mid-2016. The Asmara North project is also likely to contribute to copper production in Eritrea starting in 2016. South Africa's production of mined copper is expected to increase because of the Lift II project at the Palabora Mine starting in 2016 and expansions at PGM mines. In Uganda, the reopening of the Kilembe Mine is planned for 2015. Copper mine production is also likely to increase in Botswana as the closure of the Boseto Mine in 2015 is more than offset by the opening of the Ghanzi project in 2017 or 2018 (table 8).

The production of refined copper is expected to increase by an average of between 4% and 5% per year from 2013 to 2020. In Congo (Kinshasa), production is likely to increase at the Luilu plant between 2013 and 2018. The expansion of the Usoke Avenue plant is planned to be completed in 2016. The opening of a new plant at the Kipoi Mine is planned for 2014. Congo (Kinshasa), which did not produce refined copper in 2005, could account for 60% of the continent's refined copper output by 2020. South Africa's production of refined copper is expected to increase because of the Lift II project at the Palabora Mine starting in 2016. In Namibia, the Tschudi project was planned to start production by 2016. Zambia's output is also likely to increase (table 9).

Gold.—Production.—Africa’s gold mine production was about 531,000 kilograms in 2013, which was a decrease of about 1% compared with that of 2012. Production was nearly unchanged from 2005 because the long-term decline in South African production was offset by the increased output in Burkina Faso, Ethiopia, Ghana, Sudan, Togo, and other countries (table 10). In 2013, Africa’s share of world gold mine production was about 19% (table 4).

In 2013, South Africa accounted for 30% of African gold production; Ghana, 17%; Mali and Tanzania, 8% each; Burkina Faso, 6%; and Sudan, 5%. South Africa’s share of continental gold production decreased to 30% from 56% in 2005 because of rising production costs associated with deeper underground operations and increased production in other countries (table 10).

The increase in South Africa’s production was attributable to numerous mines in 2013, including the Beatrix, the Cooke, the Driefontein, the Kloof, the Kopanang, the Moab Khotsong, and the Tau Tona Mines. Production decreased at the Kusasaletu, the Mponeng, the Phakisa, and the Tau Lekoa Mines and shut down at the Blyvoor and the Buffelsfontein Mines. In Tanzania, increased output from artisanal miners and the Buzwagi, the New Luika, and the North Mara Mines more than offset decreased output from the Bulyanhulu, the Geita, the Golden Pride, and the Tulawaka Mines. The Kibali and the Namoya Mines started operations in Congo (Kinshasa) in 2013. The increase in Burkina Faso’s production was attributable to the opening of the Bissa Mine. In Mauritania, output increased at the Tasiast Mine. Production also increased at the Sukari Mine in Egypt (table 10).

Production by Sudanese artisanal gold miners decreased sharply in 2013. Artisanal gold mining also decreased in Kenya. In Eritrea, production decreased at the large-scale Bisha Mine in Eritrea. Output also decreased at large-scale mines in Botswana, Namibia, and Niger (table 10).

Outlook.—Gold mine production in Africa is expected to increase by an average of between 3% and 4% per year from 2013 to 2020. The increase is likely to be primarily attributable to countries in West Africa. In Ghana, the outlook is for an increase in output because of the rampup of the Akyem Mine in 2014, the expansion of the Ahafo Mine by 2017, and the opening of the Konongo Mine and the Wa Gold project by 2018. Production could start to decrease in 2020 because of the depletion of the Damang Mine. Côte d’Ivoire’s production is likely to more than double because of the expansions of the Ity Mine by the end of 2017 and the opening of the Agabou Mine in 2014 and the Yaoure Mine in 2018 (table 10).

Gold production is also expected to increase in other West African countries, including Burkina Faso, Guinea, and Senegal. Burkina Faso’s production is likely to increase because of the expansion of the Essakane and the Mana Mines between 2014 and 2020 and the opening of the Hounde project by 2018. Guinea’s production is likely to increase because of the expansion of the Lefa and the Siguirri Mines by 2016 and the startup of the Kourousa and the Tri-K projects by 2018. The outlook for Senegal is for increased output because of the opening of the OJVG and the Masawa Mines in 2014 and 2020, respectively, which would more than offset the depletion of the Sabodala Mine by 2018 (table 10).

In eastern Africa, Tanzania’s production is likely to increase until 2017 and to begin to decrease subsequently. Increased output would be attributable to the expansions of the Bulyanhulu and the North Mara Mines in 2014 and 2015, respectively. The opening of the Buckreef Mine is expected to take place in 2015, and the Singida Mine, in 2018. The closures of the Golden Pride Mine in 2013, the Tulawaka Mines in 2017, and the Buzwagi Mine in 2019 would result in decreased production after 2017. In Ethiopia, increased production is likely to be attributable to the opening of the Tulu Kapi Mine in 2016 and the Jilay Mine in 2017. The depletion of the gold-rich zones in the Bisha Mine in Eritrea is expected to be offset by the start of production at the Koka Mine and the Asmara North project in 2015 and 2016, respectively. Output in Congo (Kinshasa) is likely to more than double because of the commissioning of the Namoya Mines in 2014 and increased output at the Kibali and the Twangiza Mines (table 10).

In southern Africa, the upward trend in South Africa’s production is expected to continue between 2014 and 2018. The expansions of the Doornkop, the Kusasaletu, and the Phakisa Mines could be completed by 2018. Output at the South Deep Mine could increase between 2014 and 2022. The reopening of the Burnstone Mine and the startup of the West Rand Tailings Retreatment Project are planned for 2015. Output at the Beatrix, the Driefontein, and the Kloof Mines is likely to increase through 2017 and to decline subsequently. Namibia’s output is likely to increase because of the opening of the Otjikoto Mine in late 2014. Gold production could also increase in Zambia and Zimbabwe (table 10).

In northern Africa, the increased output from artisanal miners, the opening of a new mine at Wadi Gabgaba by 2015, and the expansion of the Hassai Mine by 2020 are expected to more than double Sudan’s gold production. In Egypt, production is likely to increase at the Sukari Mine by 2016 (table 10).

Several African countries that had only artisanal gold production in 2013 are likely to open large-scale gold mines in the near future. The opening of the New Liberty and the Dugbe 1 projects in Liberia were planned for 2015 and 2016, respectively. Other new mines opening include the Fair Bride Mine in Mozambique by 2017 and the Passendro Mine in the Central African Republic and the Boamahun Mines in Sierra Leone by 2018 (table 10).

Iron and Steel.—Production.—African production of crude steel increased by about 5% in 2013 compared with that of 2012. Output increased in Egypt, Libya, and South Africa and decreased in Algeria. In 2013, South Africa accounted for 43% of regional crude steel production; Egypt, 40%; Libya, 4%; and Algeria and Morocco, 3% each (table 12). Africa’s share of world crude steel production amounted to 1% in 2013 (table 4).

Consumption.—In 2013, world crude steel consumption increased to nearly 1.65 billion metric tons (Gt) from 1.55 Gt in 2012. African crude steel consumption increased to 36.8 Mt in 2013 from 33.1 Mt in 2012. Egypt accounted for 22% of African crude steel consumption; Algeria and South Africa, 17% each; Nigeria, 7%; Morocco and Libya, 5% each; and Kenya, 4% (World Steel Association Committee on Economic Studies, 2014a, p. 80–81).

Outlook.—Crude steel production is expected to increase by about 11% per year from 2013 to 2020. The restart of a new plant in Cape Town in 2013 and the addition of 5.6 million metric tons per year of new capacity by 2019 is expected to substantially increase South African production. Algeria's share of African steel output is likely to increase to 11% in 2020 from 3% in 2013 with the opening of a new plant at Bellara. In Egypt, several companies, including Egyptian Steel Group, planned to expand capacity. In Uganda, the Sukulu phosphate and iron ore project was likely to start producing steel in late 2016. The opening of the Liganga iron ore mine and its associated steel plant in Tanzania was planned for 2018. In Ethiopia, the Toussa plant is planned to start production by 2016. Output is also expected to increase in Libya, Tunisia, and Zambia (table 12).

Iron Ore.—**Production.**—In 2013, the iron content of ore produced in Africa was 68.6 Mt compared with 58.1 Mt in 2012. Increased production in South Africa was attributable to the Khumani, the Kolomela, the Mapochs, and the Palabora Mines; output decreased at the Sishen Mine. Output increased at the Western Range project in Liberia in 2013. In Sierra Leone, production increased at the Marampa and the Tonkolili Mines. Production also increased in Swaziland. South Africa was the leading iron ore producer in Africa and accounted for 62% of continental output; Sierra Leone, 17%; Mauritania, 12%; and Liberia, 4%. In 2010, Liberia and Sierra Leone did not mine iron ore (table 11).

Outlook.—The iron content of ore produced in Africa is expected to increase to about 180 Mt in 2020. Most of the increase is likely to be attributable to countries in West Africa. In Guinea, the planned opening of the Nimba project was in early 2016. Production from the Kalia Mine could start in 2015; the new mines in Blocks 3 and 4 near Simandou and the Nimba project, by 2018; and the new mines in Blocks 1 and 2 near Simandou and the Zogota Mine, by 2020. In Liberia, production is likely to increase because of the expansion of the Western Range project by 2018 and the openings of the Bong Mine and the Putu Range project in 2014 and 2017, respectively. In Sierra Leone, the Marampa and the Tonkolili Mines could reach full capacity by 2020 after a temporary shutdown in 2014. Iron ore production could start at the Agbaja project in Nigeria in 2018 and at the Kango Mine in Gabon in 2019 (table 11).

Iron ore production is also likely to increase in North Africa countries. Mauritania's output is expected to nearly double because of the expansions of the Guelb el Rhein, the Kedia d'Idjill, and the M'Haoudat Mines and the startup of the Guelb El Aouj Mine and other projects. In Algeria, the opening of a new mine at Gara Djebilet by 2016 is likely to increase national iron ore production (table 11).

In South Africa, increased production at the Kolomela and the Sishen Mines is planned for 2017. New mines are expected at the Bushveld Vanadium and the Ironveld Pig Iron projects by 2018 and 2019, respectively. Iron ore mining is likely to start at the Tete project in Mozambique in 2016 and at the Liganga Mine in Tanzania in 2018. Iron ore production from saprolite ore at the Musongati nickel mine in Burundi could start in 2015. In Uganda, mining at the Sukulu phosphate and iron ore project was likely to start in late 2016 (table 11).

Guinea, Liberia, and Sierra Leone did not produce iron ore in 2010; their shares of African iron ore production by 2020 are expected to be 35%, 12%, and 8%, respectively. South Africa's share is likely to decline to 30% from 62% in 2013 in spite of a substantial increase in domestic production (table 11).

Nickel.—**Production.**—African nickel mine production increased by about 43% from 2012 to 2013. In South Africa, output increased at the Nkomati Mine and PGM mining operations. Production increased at the Ambatovy Mine in Madagascar. In Botswana, increased output from the Selebi-Phikwe Mines more than offset decreased output from the Phoenix Mine. Nickel mining also increased in Zimbabwe. South Africa accounted for 44% of African nickel mine production in 2013; Madagascar, 23%; Botswana, 20%; and Zimbabwe, 12% (table 13).

Consumption.—In 2013, world primary refined nickel consumption increased to 1.78 Mt from nearly 1.67 Mt in 2012. Africa's primary refined nickel consumption decreased to 22,900 t in 2013 from 24,600 t in 2012 (International Nickel Study Group, 2015).

Outlook.—Nickel mine production is expected to increase by an average of about 11% per year from 2013 to 2020. In South Africa, nickel production is likely to increase at existing PGM mining operations and to start at new PGM mining operations, including the Bakubung, the Platreef, the Waterberg, and the Western Bushveld projects. In Madagascar, the Ambatovy Mine and refinery were planned to reach 90% of capacity in 2016. The Enterprise Mine in Zambia could open by 2018. In Burundi, the Musongati nickel mine could start production in 2015 and reach full capacity by 2020. By 2020, Madagascar and Zambia could increase their shares of African nickel mine production to 26% and 17%, respectively (table 13).

Platinum-Group Metals.—**Production.**—From 2012 to 2013, Africa's production of platinum and palladium increased by 8% and 3%, respectively. In South Africa, increased palladium and platinum production in 2013 was attributable to the Bokoni, the Eland, the Impala, the Kroondal, the Marikana, the Mogalakwena, the Nkomati, the Pilanesburg, the Two Rivers, and the Western Limb Mines. The Booyensdal and the Tharisa Mines started in 2013. Output decreased at the Batholope, the Khomanani, the Thembelani, and the Union Mines in 2013; the Crocodile River Mine shut down operations. PGM production also increased in Zimbabwe. Decreased production in Botswana was attributable to the Phoenix Mine. South Africa, which was the continent's dominant producer of PGMs, accounted for 91% and 87% of the production of platinum and palladium, respectively, in 2013 (tables 14, 15).

Outlook.—African mine production of palladium is expected to increase by an average of between 6% and 7% per year from 2013 to 2020, and mine production of platinum, between 4% and 5% per year. In South Africa, the expansion at the Eland Mine is likely to be completed by 2018; the Impala and the Marula Mines, by 2019; and the Bokoni and the Twickenham Mines, by 2020. Increased output is also expected from the Booyensdal, the Mogalakwena, the Pilanesberg, and the Tharisa Mines. The opening of the Western Bushveld Joint Venture is planned for 2015; the Styldrift Mine, for 2017; the Waterberg and the Bakubung Mines, for 2018; and the Platreef project, for 2019.

In Burundi, the Musongati nickel mine could start producing palladium and platinum in 2015 and reach full capacity by 2020. Output in Zimbabwe could also increase by 2018. In Botswana, production is likely to decrease at the Tati Mine (tables 14, 15).

Tin.—*Production.*—In 2013, African tin mine production decreased by about 11% compared with that of 2012. Output decreased at artisanal and small-scale mining operations in Burundi and Congo (Kinshasa). Rwanda's production increased as new mining companies started operations. Mining restarted in Uganda. In 2013, Congo (Kinshasa) accounted for 49% of African tin mine production; Rwanda, 41%; and Nigeria, 8% (table 16).

Africa did not produce refined tin in 2013 (table 17). Reported production of tin metal ceased in Nigeria and Rwanda in 2005 and 2006, respectively.

Outlook.—Tin mine production is expected to increase by an average of between 22% and 23% per year from 2013 to 2020 (table 16). In Congo (Kinshasa), the first and second phases of the Bisie project are planned for 2017 and 2020, respectively. Tin mining is likely to start in Morocco by 2016 with the opening of the Achmmach and Bou El Jaj projects. In Egypt, the Abu Dabbab tantalum and tin project also is expected to start by 2016. The Rwandan Government planned to more than double total production of niobium (columbium), tantalum, tin, and tungsten by 2017.

By 2020, total African refined tin production is expected to reach more than 13,000 t, of which 83% would be produced in Congo (Kinshasa) and 17% in Rwanda. In Congo (Kinshasa), new plants are expected to open in Lubumbashi and Bisie by 2015 and 2020, respectively. Rwanda's production is expected to restart in 2015 with the reopening of a plant at Karuruma (table 17).

Industrial Minerals

Diamond.—*Production.*—In 2013, Africa's share of world diamond production, by volume, was 55% (table 4). African diamond production decreased by about 2% in 2013 compared with that of 2012. In Congo (Kinshasa), large-scale diamond mines at Mbuji-Mayi and artisanal diamond miners decreased their output. In Zimbabwe, output decreased at the Marengé diamond fields. Artisanal diamond output also decreased in Ghana and Guinea (table 18).

In Botswana, production increased at the Damtshaa, the Jwaneng, the Karowe, and the Orapa Mines. South Africa's production increased because of the Cullinan, the Kimberley Underground, and the Koffiefontein Mines. Production by artisanal miners increased in Sierra Leone. Output also increased in Angola and Namibia.

Botswana accounted for 32% of African diamond output by volume; Congo (Kinshasa), 25%; Zimbabwe, 14%; Angola, 13%; South Africa, 11%; and Namibia, 2%. Large-scale mining operations were predominant in Angola, Botswana, Lesotho, Namibia, and South Africa (table 18).

In 2013, the global value of rough diamond production amounted to \$14.1 billion, of which Africa accounted for more than 58%. Botswana accounted for 26% of the value of global rough diamond output; Namibia, 10%; Angola, 9%; South Africa, 8%; Zimbabwe, 4%; and Congo (Kinshasa), 1% (Janse, 2014).

The Kimberley Process Certification Scheme (KPCS) was established in 2003 to reduce the trade in conflict diamond, particularly diamond originating from Angola, Congo (Kinshasa), and Sierra Leone. The establishment of the KPCS involved Government officials from 80 countries that produced, processed, and imported diamond as well as representatives from the European Union, the World Diamond Council, and nongovernmental organizations. As of early August 2013, the following African countries had met the minimum requirements of the KPCS—Angola, Botswana, Cameroon, Central African Republic, Congo (Brazzaville), Congo (Kinshasa), Ghana, Guinea, Lesotho, Liberia, Mauritius, Namibia, Sierra Leone, South Africa, Tanzania, Togo, and Zimbabwe (Kimberley Process, 2013).

In December 2005, the United Nations Security Council banned the importation of rough diamond from Côte d'Ivoire because of the alleged link between illegal diamond mining and the country's unresolved armed conflict. In April 2013, through Resolution 2101 (2013), the United Nations Security Council decided to renew until April 30, 2014, the measures in place to prevent any country from importing rough diamond from Côte d'Ivoire (United Nations Security Council, 2005; 2012; 2013, p. 39, 43).

A ban was placed on diamond exports from the Central African Republic by Kimberley Process (KP) members in May 2013 after a takeover of the Government by rebel forces prevented KP monitors from verifying diamond certification (Penney, 2013).

Outlook.—The production of rough diamond in Africa is expected to increase by an average of 1% per year from 2013 to 2020, with output increasing by more than 500,000 carats per year each in Angola, Botswana, Congo (Kinshasa), and South Africa. In Angola, the Government planned to increase production by 5% per year between 2014 and 2017. Botswana's output is likely to increase because of the expansion of the Oropa Mine and the opening of the Ghaghoo Mine in 2014 and the reopening of the Lerala Mine in 2015. Large-scale diamond mining is expected to increase at Tshibwe in Congo (Kinshasa). In South Africa, the expansions of the Kimberley Underground and the Koffiefontein Mines in 2016, the Finsch Mine in 2017, and the Cullinan Mine in 2019 would contribute to increased production (table 18).

Diamond production is also expected to increase in other African countries. Increased output in Guinea would be attributable to the opening of the Baoule Mine in 2015. By 2018, the Akwatia Mine in Ghana and the Kono Mine in Sierra Leone are expected to be in production. In Tanzania, the expansion at the Williamson Mine is likely to be completed by 2017. Production is also likely to increase in Lesotho and Namibia (table 18).

In Zimbabwe, mining at Marengé is expected to continue to decrease. By 2020, Zimbabwean diamond output is likely to decrease by between 40% and 45% and to more than offset increased output in other African countries (table 18).

Lithium.—*Production.*—Zimbabwe was Africa's only producer of lithium minerals. In 2013, production at the Bikita Mine decreased by about 6% (table 19).

Outlook.—Lithium mineral production at the Bikita Mine is likely to remain stable between 2013 and 2020 (table 19).

Mineral Fuels and Related Materials

Coal.—Production.—African coal production remained nearly unchanged in 2013. Decreased output in South Africa was offset by increased output in Mozambique and Zimbabwe. In South Africa, production decreased at numerous mines including the Impunzi, the Inyanda, the Koornfontein, and the Optimum Mines; mining shut down at Mooiplaats and Vuna in 2013. The increase in Mozambique's production was attributable to the Benga, the Chirodze, and the Moatize Mines. Output also increased at the Morupule Mine in Botswana and the Entuba Coalfields in Zimbabwe. South Africa, which was the dominant coal producer in Africa, accounted for 95% of regional coal output, and Mozambique and Zimbabwe, 2% each (table 20). About 99% of South Africa's coal production was bituminous. Africa accounted for about 4% of the world's total anthracite and bituminous coal production in 2013 (table 4).

Consumption.—Africa accounted for about 2.5% of world coal consumption in 2013. Within the region, South Africa accounted for 92% of African coal consumption. From 2008 to 2013, Africa's consumption of coal decreased by about 9% (BP p.l.c., 2014, p. 33).

Outlook.—African coal production is expected to increase by nearly 6% per year from 2013 to 2020. South Africa is likely to be responsible for the majority of the increase; its production could increase to 330 Mt by 2020 (table 20). The opening of the Argent Mine is planned by 2015, the Boikarabelo, the Nooitgedacht, and the Zonnebloom Mines, by 2016; the Belfast, the De Wittekrans and the Klippoortjie Mines, by 2017; the Brakfontein, the Makhado, and the Thabametsi Mines, by 2018; the Berenice Cygnus and the Springboklaagte Mines, by 2019; and the Schoonoord Mine, by 2020. The expansion at the Tweefontein Mine is likely by 2015; the Koorfontein Mine, by 2019; and the Goedgevonden Mine, by 2020. The Grootegeluk Mine is expected to ramp up to full capacity by 2018.

Mozambique was the second-ranked coal producer in Africa in 2013. The expansion of the Benga and Moatize Mines is expected to be complete by 2017, and the Chirodze Mine, by 2020. The Ncondezi and the Revuboe Mines are also likely to start up by 2016.

In Tanzania, the opening of the Edenville, the Kibo, and the Mchuchuma Mines is planned for 2018. Botswana's production is expected to increase because of the opening of the Sese Mine in 2017, the Mea and Mmamabula West Mines in 2018, and the Takatokwane Mine in 2020. The Morupule Mine could reach full capacity by 2018. Coal mining is likely to increase in Congo (Kinshasa) because of the expansion of the Luena Mine by 2019 and also in Ethiopia and Malawi (table 20).

Trade Review and Outlook

Sub-Saharan Africa's current account deficit amounted to 2.4% of the GDP in 2013. Oil-exporting countries had an average current account surplus of 3.7% of the GDP. Middle-income oil-importing countries had an average current account deficit of 5.4% of the GDP, and low-income oil-importing countries, an average deficit of 11.7% of the GDP (International Monetary Fund, 2014, p. 65).

The average current account deficit for middle-income oil-importing countries is expected to be 5.2% of the GDP in 2014 and 5% of the GDP in 2015. For low-income oil-importing countries, the deficit is forecasted to be 12.4% of the GDP in 2014 and 12.3% of the GDP in 2015. For oil-exporting countries, the surplus is predicted to be 3.3% of the GDP in 2014 and 1.8% of the GDP in 2015. Sub-Saharan Africa is expected to run a current account deficit of 2.6% of the GDP in 2014 and 3.2% of the GDP in 2015 (International Monetary Fund, 2014, p. 65).

In 2013, Europe received 44% of Africa's petroleum exports; China, 19%; the United States, 12%; India, 9%; and other countries in the Asia and the Pacific region, 8%. West African countries sent 44% of their exports to China, India, and other countries in the Asia and the Pacific region and 33% to Europe. North African countries sent 68% of their exports to Europe and 8% to the United States (BP p.l.c., 2014, p. 18).

Africa's natural gas exporters included Algeria, which accounted for 51.6% of the continent's natural gas exports; Nigeria, at least 27%; Libya, 6.3%; Equatorial Guinea, 6.1%; Egypt, at least 4.5%; and Mozambique, 3.5%. Spain received 21% of total African natural gas exports; Italy, 20%; Japan, 12%; France, 8%; and Turkey and the Republic of Korea, 6% each. Intraregional exports to other African countries accounted for only 8% of total African natural gas exports (BP p.l.c., 2014, p. 28).

In 2013, Asian countries (particularly China) received the vast majority of Africa's iron ore exports. Intraregional trade to other African countries accounted for less than 2% of total African iron ore exports (World Steel Association Committee on Economic Studies, 2014a, p. 103; 2014b, p. 21).

References Cited

- Araya, Elleni, 2013, Rough cut ban U-turn in bid to boost mining revenue: Addis Fortune [Addis Ababa, Ethiopia], August 4, p. 7.
- Bedinger, G.M., 2015a, Titanium mineral concentrates: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 172–173.
- Bedinger, G.M., 2015b, Zirconium and hafnium: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 188–189.
- BP p.l.c., 2014, Statistical review of world energy—June 2014: London, United Kingdom, BP p.l.c., 45 p.
- Bray, E.L., 2015, Bauxite and alumina: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 26–27.
- Brower, Derek, 2013, Slowly does it: Petroleum Economist, v. 80, no. 9, November, p. 42–44.
- Corathers, L.A., 2015, Manganese: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 100–101.
- Dolley, T.P., 2015, Soda ash: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 148–149.
- Economist Intelligence Group Ltd., 2012, Into Africa—Institutional investor intentions to 2016: Economist Intelligence Group Ltd., 29 p. (Accessed February 4, 2013, at http://www.investad.com/Portal/africa_addons/InvestAD_EIU_Africa_Report_2012_EN.pdf.)
- Engineering & Mining Journal, 2013, Ivanhoe planning two-phased development for Kamoia: Engineering and Mining Journal, v. 214, no. 12, December, p. 28, 44.
- Engineering & Mining Journal, 2014, Katanga—DRC's green pearl: Engineering and Mining Journal, v. 215, no. 2, February, p. 102–103.
- Ernst & Young Global Ltd., 2013, Resource nationalism update—Mining & metals—October 2013: Ernst & Young Global Ltd. (Accessed February 24, 2014, at [http://www.ey.com/Publication/vwLUAssets/EY-M-and-M-Resource-nationalism-update-October-2013/\\$FILE/EY-M-and-M-Resource-nationalism-update-October-2013.pdf](http://www.ey.com/Publication/vwLUAssets/EY-M-and-M-Resource-nationalism-update-October-2013/$FILE/EY-M-and-M-Resource-nationalism-update-October-2013.pdf).)

- Hall, Henry, 2012, West African gold—Great opportunities, complex risks: *Mineweb.com*, April 26. (Accessed April 27, 2012, at <http://www.mineweb.com/archives/west-african-gold-great-opportunities-complex-risks/?v=7516fd43adaa>.)
- Hall, Kerry, 2014, Zimbabwe bans alluvial mining: *Mining.com*, June 12. (Accessed January 3, 2014, at <http://www.mining.com/zimbabwe-bans-alluvial-mining-15737/>.)
- International Monetary Fund, 2014, World economic outlook—Legacies, clouds, uncertainties: Washington, DC, International Monetary Fund, October, 222 p.
- International Nickel Study Group, 2015, Statistics: International Nickel Study Group, November 3. (Accessed December 17, 2015, at <http://www.insg.org/stats.aspx>.)
- International Tin Research Institute, Ltd., 2013, Resume of implementation progress: *iTSCi News Bulletin*, no. 22, January, p. 1.
- International Tin Research Institute, Ltd., 2014a, Status report iTSCi Maniema field operations—July–December 2013: London, United Kingdom, International Tin Research Institute, Ltd., 7 p.
- International Tin Research Institute, Ltd., 2014b, Status report iTSCi Rwanda field operations—July–December 2013: London, United Kingdom, International Tin Research Institute, Ltd., unpaginated.
- Janse, Bram, 2014, Diamond market starts to sparkle: *Mining Journal*, September 12, p. 18–26.
- Jasinski, S.M., 2015, Phosphate rock: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 118–119.
- Jiwaji, Aamera, 2013, Laying down the law for mining companies: *African Business*, no. 403, December, p. 43–44.
- Kaira, Chamwe, 2013, Namibia—Phosphate mining banned: *AllAfrica.com*, September 19. (Accessed January 3, 2014, at <http://allafrica.com/stories/201309190630.html>.)
- Karerwa, J.C.N., 2013, Code Minier du Burundi: Presidency of the Republic of Burundi, October 25. (Accessed June 16, 2014, at <http://www.presidence.bi/spip.php?article4153>.)
- Karpel, Steve, 2014, Red dawn or red sunset?: *Metal Bulletin*, March, p. 24–25, 28.
- Kimberley Process, 2013, Participants: Kimberley Process. (Accessed April 29, 2015, at <http://www.kimberleyprocess.com/en/participants>.)
- Kushner, Jacob, 2014, Kenya resource hub push: *African Mining*, v. 18, no. 8, March–April, p. 48–51.
- Levin, Estelle, and Cook, Rupert, 2013, Mineral supply chain due diligence audits and risk assessments in the Great Lakes Region: Bujumbura, Burundi, International Conference on the Great Lakes Region, 56 p.
- Loferski, P.J., 2015, Platinum-group metals: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 120–121.
- Metal Bulletin, 2013, World news—Africa: *Metal Bulletin*, no. 9315, August 12, p. 11.
- Metal Bulletin, 2014a, Demanding markets: *Metal Bulletin*, September, p. 25–27.
- Metal Bulletin, 2014b, Leading edge of low cost output, *in* *Metal Bulletin supplements—Arab aluminium 2014*: *Metal Bulletin*, November, p. 44–45.
- Mwape, P., Mnguni, M., Jali, N., and Menoe, K., 2015, General review, *in* *South Africa's mineral industry 2013/2014*: Johannesburg, South Africa, Department of Mineral Resources of the Republic of South Africa, p. 1–40.
- Mosbacher, Jack, 2013, Fighting the resource curse—Uganda's pivotal moment: *The Washington Quarterly*, v. 36, no. 4, Fall, p. 43–54. (Accessed July 17, 2014, at <http://www.ciaonet.org/attachments/24392/uploads>.)
- Njanji, Susan, 2014, Zimbabwe to press ahead with platinum export ban: *The Financial Express*, January 3. (Accessed January 3, 2014, at <http://old.thefinancialexpress-bd.com/2013/11/23/5342>.)
- Northern Miner, The, 2013, Ivanhoe outlines major copper mine at Kamao: *The Northern Miner*, v. 99, no. 44, December 16–22, p. 19.
- Olson, D.W., 2015, Diamond (industrial): U.S. Geological Survey Mineral Commodity Summaries 2015, p. 50–51.
- Papp, J.F., 2015, Chromium: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 42–43.
- Penney, Joe, 2013, Central African Republic calls for end to ban on diamond exports: Thomson Reuters, November 29. (Accessed January 3, 2014, at <http://www.reuters.com/article/2013/11/29/centralafrica-diamonds-idUSL5N0JE3N020131129>.)
- Pinkham, Myra, 2015, A delicate balance: *Metal Bulletin*, December–January, p. 44–47.
- Quinlan, Martin, 2013, Bold plan for an inland refinery: *Petroleum Economist*, v. 80, no. 9, November, p. 36–37.
- Shedd, K.B., 2015, Cobalt: U.S. Geological Survey Mineral Commodity Summaries 2015, p. 46–47.
- SNL Metals Economic Group, 2013 Trends in worldwide exploration budgets: Strategic Report November/December, 11 p. (Accessed February 21, 2014, at <http://www.snl.com/SNLWebPlatform/Content/Research/ResearchLibrary.aspx>.)
- Thomson Reuters, 2013, Update 3—Guinea cuts mining taxes in overture to investors: Thomson Reuters, April 9. (Accessed December 18, 2015, at <http://www.reuters.com/article/guinea-mining-code-idUSL5N0CW24C20130409>.)
- United Nations Group of Experts, 2013, Letter dated 19 July 2013 from the Chair of the Security Council Committee established pursuant to resolution 1533 (2004) concerning the Democratic Republic of the Congo addressed to the President of the Security Council: New York, New York, United Nations Security Council, 175 p.
- United Nations Security Council, 2005, Resolution 1643 (2005) adopted by the Security Council at its 5327th meeting, on 15 December 2005: New York, New York, United Nations Security Council, December 15, 4 p.
- United Nations Security Council, 2012, Letter dated 31 December 2012 from the Chair of the Security Council Committee established pursuant to Resolution 1572 (2004) concerning Côte d'Ivoire addressed to the President of the Security Council: New York, New York, United Nations Security Council Report S/2012/981, December 31, 9 p.
- United Nations Security Council, 2013, Concerned by 'Significant' risks to Côte d'Ivoire's stability, Security Council adopts Resolution 2101, extending arms embargo, financial, travel measures: New York, New York, United Nations Security Council, April 25. (Accessed December 19, 2015, at <http://www.un.org/press/en/2013/sc10988.doc.htm>.)
- U.S. Embassy, Bujumbura, Burundi, 2014, Conflict minerals and traceability in Burundi: U.S. Department of State Telegram 170629Z, April 17, 5 p.
- U.S. Securities and Exchange Commission, 2012, 17 CFR parts 240 and 249b conflict minerals; final rule: *Federal Register*, v. 77, no. 177, September, p. 56274–56365.
- Wass, Gabriella, and Musiime, Chris, 2013, Business, human rights, and Uganda's oil—Part I—Uganda's oil sector and potential threats to human rights: Antwerp, Belgium, International Peace Information Service, 37 p. (Accessed July 17, 2014, at <http://ipisresearch.eu/download.php?id%3D413>.)
- World Steel Association Committee on Economic Studies, 2014a, Steel statistical yearbook 2014: Brussels, Belgium, World Steel Association, 121 p.
- World Steel Association Committee on Economic Studies, 2014b, World steel in figures 2014: Brussels, Belgium, World Steel Association, 30 p.

TABLE 1
AFRICA: AREA AND POPULATION IN 2013

Country	Area ¹ (square kilometers)	Estimated population ² (thousands)
Algeria	2,381,741	39,208
Angola	1,246,700	21,472
Benin	112,622	10,323
Botswana	581,730	2,021
Burkina Faso	274,200	16,935
Burundi	27,830	10,163
Cameroon	475,440	22,254
Cape Verde	4,033	499
Central African Republic	622,984	4,616
Chad	1,284,000	12,825
Comoros	2,235	735
Congo (Brazzaville)	342,000	4,448
Congo (Kinshasa)	2,344,858	67,514
Côte d'Ivoire	322,463	20,316
Djibouti	23,200	873
Egypt	1,001,450	82,056
Equatorial Guinea	28,051	757
Eritrea	117,600	6,333
Ethiopia	1,104,300	94,101
Gabon	267,667	1,672
Gambia, The	11,295	1,849
Ghana	238,533	25,905
Guinea	245,857	11,745
Guinea-Bissau	36,125	1,704
Kenya	580,367	44,354
Lesotho	30,355	2,074
Liberia	111,369	4,294
Libya	1,759,540	6,202
Madagascar	587,041	22,925
Malawi	118,484	16,363
Mali	1,240,192	15,302
Mauritania	1,030,700	3,890
Mauritius	2,040	1,296
Mayotte	374 ³	208 ³
Morocco	446,550	33,008
Mozambique	799,380	25,834
Namibia	824,292	2,303
Niger	1,267,000	17,831
Nigeria	923,768	173,615
Reunion	2,512 ³	793 ³
Rwanda	26,338	11,777
Sao Tome e Principe	964	187 ⁴
Senegal	196,722	14,133
Seychelles	455	89
Sierra Leone	71,740	6,092
Somalia	637,657	10,496
South Africa	1,219,090	52,982
South Sudan	644,329	11,090 ⁴
Sudan	1,861,484	34,848 ⁴
Swaziland	17,364	1,250
Tanzania	947,300	49,253

See footnotes at end of table.

TABLE 1—Continued
AFRICA: AREA AND POPULATION IN 2013

Country	Area ¹ (square kilometers)	Estimated population ² (thousands)
Tunisia	163,610	10,887
Uganda	241,038	37,579
Western Sahara	266,000	538 ⁴
Zambia	752,618	14,539
Zimbabwe	390,757	14,150
Total	30,315,129	1,107,323
World total	510,072,000	7,125,000

¹Source: U.S. Central Intelligence Agency, The World Factbook 2013.

²Source: The World Bank, 2014 World Development Indicators Database.

³Source: Embassy of France in Washington, DC.

⁴Source: U.S. Census Bureau.

TABLE 2
AFRICA: GROSS DOMESTIC PRODUCT^{1,2}

Country	Gross domestic product in 2013 based on purchasing power parity		Real gross domestic product growth rate (percentage)		
	Gross value (billion dollars)	Per capita (dollars)			
			2011	2012	2013
Algeria	522.6	13,788	2.8	3.3	2.8
Angola	166.1	7,978	3.9	5.2	6.8
Benin	18.5	1,793	3.3	5.4	5.6
Botswana	31.7	15,241	6.2	4.3	5.9
Burkina Faso	27.7	1,638	5.0	9.0	6.6
Burundi	7.9	877	4.2	4.0	4.5
Cameroon	62.9	2,861	4.1	4.6	5.5
Cape Verde	3.2	6,248	4.0	1.2	0.5
Central African Republic	2.8	604	3.3	4.1	-36.0
Chad	26.8	2,432	0.1	8.9	3.9
Comoros	1.1	1,617	2.5	3.0	3.5
Congo (Brazzaville)	26.1	6,232	3.4	3.8	3.2
Congo (Kinshasa)	50.5	655	6.9	7.2	8.5
Côte d'Ivoire	65.2	2,710	-4.4	10.7	8.7
Djibouti	2.7	2,916	4.5	4.8	5.0
Egypt	910.0	10,870	1.8	2.2	2.1
Equatorial Guinea	25.6	33,767	5.0	3.2	-4.8
Eritrea	7.6	1,197	8.7	7.0	1.3
Ethiopia	126.7	1,427	11.4	8.8	9.7
Gabon	32.1	20,520	6.9	5.5	5.6
Gambia, The	3.1	1,642	-4.3	5.3	6.3
Ghana	103.0	4,029	15.0	8.8	7.1
Guinea	14.7	1,321	3.9	3.8	2.3
Guinea-Bissau	2.4	1,411	9.0	-2.2	0.3
Kenya	126.0	3,009	7.6	4.6	4.6
Lesotho	5.3	2,765	4.3	6.0	5.7
Liberia	3.7	887	7.5	8.3	8.7
Libya	126.6	20,681	-62.1	104.5	-13.6
Madagascar	32.1	1,398	1.5	2.5	2.4
Malawi	12.8	748	4.3	1.9	5.2
Mali	25.2	1,493	2.7	0.0	1.7
Mauritania	11.8	3,187	4.0	7.0	6.7
Mauritius	22.3	17,118	3.9	3.2	3.2
Mayotte	NA	NA	NA	NA	NA
Morocco	241.7	7,356	5.0	2.7	4.4
Mozambique	27.0	1,046	7.3	7.3	7.1

See footnotes at end of table.

TABLE 2—Continued
AFRICA: GROSS DOMESTIC PRODUCT^{1,2}

Country	Gross domestic product in 2013 based on purchasing power parity		Real gross domestic product growth rate (percentage)		
	Gross value (billion dollars)	Per capita (dollars)	2011	2012	2013
	Namibia	22.2	10,234	5.7	5.0
Niger	16.3	984	2.3	11.1	4.1
Nigeria	972.6	5,746	4.9	4.3	5.4
Reunion	NA	NA	NA	NA	NA
Rwanda	17.4	1,608	7.5	8.8	4.7
Sao Tome e Principe	0.6	2,999	4.9	4.0	4.0
Senegal	31.7	2,243	1.7	3.4	3.5
Seychelles	2.2	23,532	7.9	2.8	3.5
Sierra Leone	11.7	1,924	6.0	15.2	20.1
Somalia ³	1.3	128	2.6	2.6	NA
South Africa	662.6	12,507	3.6	2.5	1.9
South Sudan	26.1	2,401	NA	-47.6	27.1
Sudan	152.3	4,429	-1.2	-2.8	3.3
Swaziland	8.4	7,646	-0.6	1.9	2.8
Tanzania	84.9	1,834	6.4	6.9	7.0
Togo	9.5	1,390	4.8	5.9	5.1
Tunisia	119.7	10,998	-1.9	3.7	2.3
Uganda	61.9	1,681	6.2	2.8	5.8
Western Sahara ⁴	0.9	2,500	NA	NA	NA
Zambia	57.1	3,926	6.4	6.8	6.7
Zimbabwe	25.6	1,954	11.9	10.6	3.3
Regional total	5,161	4,660 ⁵	4.7 ⁶	4.3 ⁶	5.2 ⁶
World total	101,934	14,307 ⁵	4.1	3.4	3.3

NA Not available.

¹Source: International Monetary Fund, World Economic Outlook Database, October 2014.

²Gross domestic product listed may differ from that reported in individual country chapters owing to differences in the source or date of reporting.

³Source: United Nations Data 2012.

⁴Source: U.S. Central Intelligence Agency, The World Factbook 2007 estimate.

⁵Calculated using country data reported by the International Monetary fund and the World Bank.

⁶Weighted average.

TABLE 3
SELECTED SIGNIFICANT AFRICAN EXPLORATION SITES IN 2013

Country	Type ¹	Site	Commodity ²	Company	Resource ^{2,3}
Burkina Faso	F	Bombore	Au	Orezone Gold Corp.	4.6 Moz Au (D).
Do.	F	Houndé	Au	Endeavor Mining Corp.	1.5 Moz Au (R).
Do.	F	Karma	Au	True Gold Mining Inc.	949,000 oz Au (PR).
Do.	P	Mana	Au	SEMAFO, Inc.	2.3 Moz Au (R).
Do.	F	Yaramoko	Au	Roxgold Inc.	850,000 oz Au (ID).
Congo (Kinshasa)	F	Kapulo	Cu	Mawson West Ltd.	188,000 t Cu (D).
Eritrea	P	Bisha	Au, Ag, Cu, Zn	Newsun Resources Ltd.	750,000 oz Au, 36 Moz Ag, 472,000 t Cu, 1.2 Mt Zn (R).
Ghana	E	Kubi	Au	PMI Gold Corp.	233,000 oz Au (D).
Do.	P	Wassa	Au	Golden Star Resources Ltd.	1.5 Moz Au (R).
Guinea	F	Tri-K	Au	Avocet Mining plc.	480,000 oz Au (PR).
Liberia	F	Dugbe F	Au	Hummingbird Resources plc.	1.9 Moz Au (D).
Mali	E	Fekola	Au	Papillon Resources Ltd.	4.6 Moz Au (D).
Namibia	D	Otjikoto	Au	B2Gold Corp.	1.3 Moz Au (PR).
Sierra Leone	E	Nimini	Au	Polo Resources Ltd.	550,000 oz Au (D).
South Africa	E	Platreef	PGM, Au, Cu, Ni	Ivanhoe Platinum Ltd.	38 Moz 3PGM, 3.4 Moz Au, 1.1 Mt Cu, 1.7 Mt Ni (D).
Do.	E	Waterberg	Pt, Pd, Au, Cu, Ni	Platinum Group Metals Ltd.	5.2 Moz Pt, 10.6 Moz Pd, 1.7 Moz Au, 62,000 t Cu, 73,000 t Ni (IF).
Sudan	E	Block 14 (Galat Sufar)	Au	Orca Gold Inc.	1.3 Moz Au (D).
Zambia	E	Mumbwa	Cu, Au, Ag, U ₃ O ₈	Blackthorn Resources Ltd.	795,000 t Cu, 33,000 oz Au, 1.1 Moz Ag, 937 t U ₃ O ₈ (D).
Do. Ditto.					

¹D—Approved for development; E—Active exploration; F—Feasibility work ongoing/completed; P—Exploration related to existing producing operation.

²Abbreviations used in this table for commodities include the following: Ag—silver; Au—gold; Cu—copper; Ni—nickel; Pd—palladium; PGM—platinum-group metals;

Pt—platinum; U₃O₈—uranium oxide; Zn—zinc. Abbreviations used in this table for units of measure include the following: Moz—million troy ounces; Mt—million metric tons; oz—troy ounces; t—metric tons.

³Based on 2013 data reported from various sources; D—measured + indicated; ID—indicated; IF—inferred; PR—probable; R—proven + probable. Resource data not verified by the U.S. Geological Survey.

TABLE 4
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2013¹
(Thousand metric tons unless otherwise specified)

Country	Metals										
	Aluminum		Chromite, mine output, gross weight	Cobalt, mine output, Co content (metric tons)	Copper, mine output, Cu content	Gold, mine output (kilograms)	Iron ore, gross weight	Iron and steel	Lead, mine output, Pb content (metric tons)	Manganese ore, mine output, Mn content	
	Bauxite	Metal ²									
Algeria	--	--	--	--	--	140	1,067	440	--	--	--
Angola	--	--	--	--	--	--	--	--	--	--	--
Benin	--	--	--	--	--	--	--	--	--	--	--
Botswana	--	--	--	248	51	1,206	--	--	--	--	--
Burkina Faso	--	--	--	--	--	32,714 ³	--	--	--	--	23 ^e
Burundi	--	--	--	--	--	400 ^e	--	--	--	--	--
Cameroon	--	75	--	--	--	1,600 ^{e,4}	--	--	--	--	--
Cape Verde	--	--	--	--	--	--	--	--	--	--	--
Central African Republic	--	--	--	--	--	60 ^{e,4}	--	--	--	--	--
Chad	--	--	--	--	--	--	--	--	--	--	--
Congo (Brazzaville)	--	--	--	--	--	150 ^e	--	--	--	--	--
Congo (Kinshasa) ^e	--	--	--	58,000	970	17,000	--	NA	--	--	--
Côte d'Ivoire	--	--	--	--	--	12,862	--	--	--	--	99
Djibouti	--	--	--	--	--	--	--	--	--	--	--
Egypt	--	520	--	--	--	11,101	3,000 ^e	6,754	--	--	40 ^e
Equatorial Guinea	--	--	--	--	--	NA	--	--	--	--	--
Eritrea	--	--	--	--	22	2,900	--	--	--	--	--
Ethiopia	--	--	--	--	--	12,581	--	130 ^e	--	--	--
Gabon	--	--	--	--	--	1,136	--	--	--	--	1,800 ^e
Gambia, The	--	--	--	--	--	--	--	--	--	--	--
Ghana	827	40 ^e	--	--	--	88,376 ⁵	--	--	--	--	533 ^e
Guinea	16,900	--	--	--	--	15,428 ⁶	--	--	--	--	--
Kenya ^e	--	11	--	--	--	2,100	--	400	--	--	--
Lesotho	--	--	--	--	--	--	--	--	--	--	--
Liberia	--	--	--	--	--	600 ^{e,4}	4,698	--	--	--	--
Libya	--	--	--	--	--	--	--	--	--	--	--
Madagascar ^e	--	--	91	2,200	--	--	--	715	--	--	--
Malawi	--	--	--	--	--	--	--	--	--	--	--
Mali	--	--	--	--	--	40,803 ⁷	--	--	--	--	--
Mauritania	--	--	--	--	38	9,517	13,000	5 ^e	--	--	--
Mauritius	--	--	--	--	--	--	--	--	--	--	--
Morocco and Western Sahara	--	--	--	1,353	18	550	301	558	17,435	49	--
Mozambique	--	562	--	--	--	198	--	--	--	--	--
Namibia	--	--	--	--	5	1,960	--	--	11,000 ^e	76 ^e	--
Niger	--	--	--	--	--	1,150	--	--	--	--	--

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2013¹

(Thousand metric tons unless otherwise specified)

Country	Metals										
	Aluminum		Chromite, mine output, gross weight	Cobalt, mine output, Co content (metric tons)	Copper, mine output, Cu content	Gold, mine output (kilograms)	Iron and steel		Lead, mine output, Pb content (metric tons)	Manganese ore, mine output, Mn content	
	Bauxite	Metal ²					Iron ore, gross weight	Steel, crude			
Nigeria ^a	--	2 ⁸	--	--	--	4,200	50	400	--	--	
Reunion	--	--	--	--	--	--	--	--	--	--	
Rwanda	--	--	--	--	--	--	--	--	--	--	
Senegal	--	--	--	--	--	6,445	--	--	--	--	
Seychelles	--	--	--	--	--	--	--	--	--	--	
Sierra Leone	616	--	--	--	--	98	20,300	--	--	--	
Somalia	--	--	--	--	--	--	--	--	--	--	
South Africa	--	822	13,645	2,800 ^e	77	159,724	71,543	7,200 ^e	41,848	4,300	
South Sudan	--	--	--	--	--	--	--	--	--	--	
Sudan	--	--	31	--	--	24,813	--	--	--	1,593	
Swaziland	--	--	--	--	--	--	1,200 ^e	--	--	--	
Tanzania	50 ^e	--	--	--	6	43,390	--	--	--	--	
Togo ^e	--	--	--	--	--	19,000	50	--	--	--	
Tunisia	--	--	--	--	--	--	244	109	--	--	
Uganda ^e	--	--	--	--	--	--	5	64	--	--	
Zambia ^e	--	--	--	5,200	760	4,500	--	55	--	40	
Zimbabwe	--	--	355	319	8	14,065	--	15 ^e	--	--	
Total	18,400	2,030	14,100	70,100	1,960	531,000	115,000	16,800	70,300	8,550	
Share of world total	7%	4%	41%	63%	11%	19%	4%	1%	1%	46%	
United States	NA	1,950	--	--	1,250	230,000	53,000	86,900	340,000	--	
Share of world total	NA	3%	--	--	7%	8%	2%	5%	6%	--	
World total	282,000	56,400	34,500	112,000	18,100	2,860,000	3,210,000	1,730,000	5,420,000	18,700	

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2013¹

(Thousand metric tons unless otherwise specified)

Country	Metals—			Industrial minerals					Mineral fuels			
	Continued			Cement, hydraulic	Diamond, natural (thousand carats) ⁹	Graphite (metric tons)	Phosphate rock, gross weight	Coal, anthracite and bituminous	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U ₃ O ₈ content (metric tons)		
	Zinc, mine output, Zn content (metric tons)											
Algeria	--	18,000	--	1,151	--	--	--	--	574,875	--	--	--
Angola	--	1,700 ^e	--	9,360 ¹⁰	--	--	--	--	657,365	--	--	--
Benin	--	1,422	--	--	--	--	--	--	--	--	--	--
Botswana	--	--	--	23,190 ¹¹	--	--	--	1,496	--	--	--	--
Burkina Faso	64	580	--	--	--	--	--	--	--	--	--	--
Burundi	--	100 ^e	--	--	--	--	--	--	--	--	--	--
Cameroon	--	1,400 ^e	--	3	--	--	--	--	24,275	--	--	--
Cape Verde	--	--	--	--	--	--	--	--	--	--	--	--
Central African Republic	--	--	--	(12) ^e	--	--	--	--	--	--	--	--
Chad ^c	--	200	--	--	--	--	--	--	35,000	--	--	--
Congo (Brazzaville)	--	170 ^e	--	56	--	--	--	--	88,338	--	--	--
Congo (Kinshasa)	12,566	447	--	18,045 ¹³	--	--	--	4	8,351	--	--	--
Côte d'Ivoire	--	80 ^e	--	--	--	--	--	--	9,141	--	--	--
Djibouti	--	150 ^e	--	--	--	--	--	--	--	--	--	--
Egypt	--	50,000 ^e	--	--	--	--	5,922	--	260,610	--	--	--
Equatorial Guinea	--	--	--	--	--	--	--	--	100,000 ^e	--	--	--
Eritrea	--	260 ^e	--	--	--	--	--	--	--	--	--	--
Ethiopia	--	5,000 ^e	--	--	--	--	--	--	--	--	--	--
Gabon	--	200 ^e	--	NA	--	--	--	--	85,447	--	--	--
Gambia, The	--	--	--	--	--	--	--	--	--	--	--	--
Ghana ^e	--	3,000	--	169 ⁸	--	--	--	--	35,500	--	--	--
Guinea	--	377	--	202	--	--	--	--	--	--	--	--
Kenya	--	5,059	--	--	--	--	--	--	--	--	--	--
Lesotho	--	--	--	414 ¹⁴	--	--	--	--	--	--	--	--
Liberia	--	182	--	44	--	--	--	--	--	--	--	--
Libya	--	2,000 ^e	--	--	--	--	--	--	360,620	--	--	--
Madagascar ^c	--	150	--	--	--	4,300	--	--	36 ⁸	--	--	1,335 ⁸
Malawi ^e	--	320	--	--	--	--	--	98	--	--	--	--
Mali	--	--	--	--	--	--	20 ^e	--	--	--	--	--
Mauritania	--	650 ^e	--	--	--	--	--	--	2,500	--	--	--
Mauritius	--	--	--	--	--	--	--	--	--	--	--	--
Morocco and Western Sahara ^c	47,600	14,900	--	--	--	--	26,400	--	1,847	--	--	--
Mozambique	--	1,299	--	--	--	--	--	6,343	--	--	--	--
Namibia	184,109	662	--	1,689	--	--	--	--	--	--	--	5,098

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2013¹

(Thousand metric tons unless otherwise specified)

Country	Metals—		Industrial minerals				Mineral fuels		
	Continued Zinc, mine output, Zn content (metric tons)		Cement, hydraulic	Diamond, natural (thousand carats) ⁹	Graphite (metric tons)	Phosphate rock, gross weight	Coal, anthracite and bituminous	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U ₃ O ₈ content (metric tons)
Niger	--	70 ^e	--	--	--	--	242	6,498	5,300
Nigeria ^e	--	18,000	--	--	--	--	40 ^e	800,488 ⁸	--
Reunion	--	--	--	--	--	--	--	--	--
Rwanda	--	100 ^e	--	--	--	--	--	--	--
Senegal	--	5,191	--	--	882	--	--	117	--
Seychelles	--	NA	--	--	--	--	--	--	--
Sierra Leone	--	313	--	609 ¹⁵	--	--	--	--	--
Somalia	--	--	--	--	--	--	--	--	--
South Africa	30,145	13,500 ^e	--	8,168	--	2,132	256,282	139	626
South Sudan	--	--	--	--	--	--	--	44,000 ^e	--
Sudan	--	3,500 ^e	--	--	--	--	--	45,200	--
Swaziland	--	--	--	--	--	--	205 ^e	--	--
Tanzania	--	2,600 ^e	--	180 ¹⁶	--	20 ^e	129	--	--
Togo	--	1,233	--	(12)	--	1,214	--	--	--
Tunisia	--	7,504	--	--	--	3,283	--	22,035	--
Uganda	--	2,023	--	--	--	--	--	--	--
Zambia ^e	--	1,200	--	--	--	--	200	--	--
Zimbabwe ^e	--	1,200	--	10,412 ⁸	--	6,934 ⁸	4,980	--	--
Total	274,000	165,000	72,500	11,200	41,000	270,000	3,160,000	12,400	
Share of world total	3%	4%	55%	1%	17%	4%	11%	17%	
United States	784,000	77,400	--	--	31,200	1,000,000	2,720,000	2,160	
Share of world total	6%	2%	--	--	13%	15%	10%	3%	
World total	13,400,000	4,090,000	131,000	1,100,000	243,000	6,860,000	28,500,000	73,900	

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2013¹

⁵Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. NA Not available. -- Zero or zero percent.
¹Totals may not add owing to independent rounding. Percentages are calculated on unrounded data. Includes data available as of September 8, 2015.
²Primary and secondary production.
³Excludes artisanal mining production, which is estimated to fluctuate between 1,000 and 10,000 kilograms per year.
⁴From artisanal mining.
⁵Excludes artisanal and small-scale mining output.
⁶Excludes artisanal mining, which has historically ranged between 1,500 and 5,000 kilograms per year.
⁷Excludes artisanal mining, which is estimated to be more than 3,000 kilograms per year.
⁸Reported figure.
⁹Gemstones and industrial diamond.
¹⁰Approximately 90% gem and 10% industrial grade.
¹¹Assumed to contain about 70% gem and near gem.
¹²Less than ½ unit or ½ percent.
¹³An estimated 20% of total diamond is gem quality; the majority of production is from artisanal mining.
¹⁴Estimated to be approximately 60% gem quality.
¹⁵Approximately 80% gem and 20% industrial grade.
¹⁶Estimated to represent 85% gem-quality or semigem-quality and 15% industrial-quality stones. Excludes smuggled artisanal production.

TABLE 5
AFRICA: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2005–2020¹

(Thousand metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Ghana	727	595	753	827	800	800	800
Guinea	14,600	15,900	16,041	16,887	27,000	47,000	57,000
Mozambique	10	9	8	7	7	7	7
Sierra Leone	--	1,090	776	616	1,000	1,000	1,000
Tanzania	2	39	58	50	50	50	50
Total	15,300	17,600	17,600	18,400	29,000	49,000	59,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 6
AFRICA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY ALUMINUM METAL PRODUCTION, 2005–2020¹

(Thousand metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Cameroon	87	76	52	75	70	70	70
Egypt ²	244	461	517	520	520	520	520
Ghana	--	--	40	40	40	40	40
Kenya ²	2	8	9	11	11	11	11
Mozambique	555	557	564	562	570	570	570
Nigeria	--	21	26	2	--	--	--
South Africa	846	807	665	822	700	700	700
Total	1,730	1,930	1,870	2,030	1,900	1,900	1,900

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²Egypt produced primary and secondary refined aluminum; primary production in all other African aluminum-producing countries, with the exception of Kenya, which also produced secondary refined aluminum.

TABLE 7
AFRICA: HISTORIC AND PROJECTED COBALT MINE PRODUCTION, 2005–2020¹

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Botswana	326	272	195	248	200	200	200
Burundi	--	--	--	--	100	520	1,000
Congo (Kinshasa)	24,500	60,000	52,000	58,000	61,000	64,000	74,000
Madagascar	--	--	670	2,200	5,900	5,900	5,900
Morocco	1,100	3,130	1,314	1,353	2,500	2,500	2,500
South Africa	400	1,800	2,500	2,800	2,800	3,000	3,100
Zambia	9,300	6,200	4,200	5,200	5,200	6,000	6,000
Zimbabwe	281	79	88	319	300	300	300
Total	35,900	71,500	61,000	70,100	78,000	82,000	93,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 8
AFRICA: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 2005–2020¹

(Metal content in thousand metric tons)

Country	2005	2010	2012	2013	2016 ^e	2018 ^e	2020 ^e
Botswana	31	48	36	51	31	81	81
Burundi	--	--	--	--	--	2	4
Congo (Kinshasa)	97	420	660	970	880	1,000	1,300
Eritrea	--	--	--	22	50	21	50
Mauritania	--	37	38	38	40	40	40
Morocco	4	13	18	18	20	20	20
Namibia	10	--	5	5	7	7	7
South Africa	89	103	81	77	61	110	120
Tanzania	4	6	6	6	6	6	3
Uganda	--	--	--	--	18	18	18
Zambia	447	672	695	760	800	1,000	1,300
Zimbabwe	3	5	6	8	10	10	10
Total	685	1,300	1,550	1,960	1,900	2,300	3,000

^eEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 9
AFRICA: HISTORIC AND PROJECTED REFINED COPPER METAL PRODUCTION, 2005–2020¹

(Thousand metric tons)

Country	2005	2010	2012	2013	2016 ^e	2018 ^e	2020 ^e
Congo (Kinshasa)	--	261	473	685	740	850	1,100
Egypt ²	3	3	3	3	4	4	4
Namibia	--	--	--	--	17	20	25
South Africa	99	81	66	81	53	90	90
Zambia	399	527	530	568	600	600	600
Zimbabwe	7	5	3	3	5	5	5
Total	508	877	1,080	1,340	1,400	1,600	1,800

^eEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²Produced only secondary refined copper; primary refined copper produced in all other African countries.

TABLE 10
AFRICA: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 2005–2020¹

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Algeria	--	723	264	140	200	200	200
Benin ²	--	--	--	--	--	--	--
Botswana	4	1,774	1,522	1,206	1,400	1,400	1,400
Burkina Faso ³	625	22,939	28,939	32,714	35,700	40,000	40,100
Burundi	--	300	400	400	540	700	900
Cameroon ²	1,000	1,600	1,500	1,600	(4)	(4)	(4)
Central African Republic ²	15	59	55	60	100	5,000	5,000
Chad	150	100	(4)	(4)	(4)	(4)	(4)
Congo (Brazzaville)	120	150	150	150	(4)	(4)	(4)
Congo (Kinshasa)	7,200	12,000	14,000	17,000	38,000	38,000	38,000
Cote d'Ivoire ³	1,335	5,310	11,027	12,862	17,500	24,100	29,400
Egypt	--	9,847	8,148	11,101	15,000	15,000	15,000
Equatorial Guinea	200	200	(4)	(4)	(4)	(4)	(4)
Eritrea	25	50	9,735	2,900	3,200	4,700	5,500
Ethiopia	4,376	6,773	12,311	12,581	12,000	15,000	17,000
Gabon ²	300	--	666	1,136	1,200	1,400	1,400
Ghana ³	66,852	76,332	86,699	88,376	86,700	101,000	98,400
Guinea ³	25,097	15,217	14,790	15,428	16,900	21,100	21,100
Kenya	616	2,355	3,600	2,100	200	200	200
Liberia ²	27	666	641	600	4,800	7,600	7,600
Madagascar	10	46	157	--	--	--	--
Mali ³	44,230	36,360	40,132	40,803	41,800	43,400	40,800
Mauritania	--	8,305	7,652	9,517	10,000	10,000	10,000
Morocco	1,786	650	519	550	700	700	700
Mozambique	63	106	178	198	850	1,500	1,700
Namibia ⁵	2,703	2,675	2,302	1,960	6,800	8,300	8,300
Niger	4,962	1,950	1,662	1,150	750	1,500	1,500
Nigeria	30	3,718	4,000	4,200	4,000	4,000	4,000
Rwanda	10	3	--	--	--	--	--
Senegal	600	4,381	6,666	6,445	7,100	7,500	10,800
Sierra Leone ⁶	53	270	135	98	100	3,100	3,100
South Africa	294,671	188,702	155,286	159,724	160,000	170,000	170,000
Sudan	3,625	26,317	46,133	24,813	37,000	43,000	55,000
Tanzania	47,270	39,448	40,650	43,390	56,000	54,000	51,000
Togo ⁷	6,179	10,452	18,551	19,000	20,000	20,000	20,000
Uganda	46	4	1	--	--	--	--
Zambia	440	3,600	4,500	4,500	5,500	6,000	6,000
Zimbabwe	14,024	9,100	14,742	14,065	15,000	16,000	16,000
Total	529,000	492,000	538,000	531,000	600,000	660,000	680,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²From artisanal mining.

³Excludes production from artisanal mining.

⁴Gold is produced, but information is inadequate to make reliable estimates of output.

⁵Does not include gold produced as a byproduct of copper mining.

⁶From artisanal mining for the years 2005 and 2010 only.

⁷May include artisanal gold production from neighboring countries; however, information is inadequate to make reliable estimates of the output that originated from these countries.

TABLE 11
AFRICA: HISTORIC AND PROJECTED BENEFICIATED IRON ORE PRODUCTION, 2005–2020¹

(Fe content in thousand metric tons)

Country	Average grade	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Algeria	50%	800	771	946	565	800	1,600	1,600
Burundi	61%	--	--	--	--	40	210	420
Egypt	55%	880	700	1,500	1,500	1,500	1,500	1,500
Gabon	64%	--	--	--	--	--	1,100	2,000
Guinea	37% to 55%	--	--	--	--	3,000	44,000	63,000
Kenya	60%	--	17	40	--	--	--	--
Liberia	34% to 61%	--	--	1,980	2,800	6,900	18,600	22,300
Mauritania	59% to 72%	7,000	7,500	7,280	8,450	11,700	16,300	16,300
Morocco	54%	4	24	141	146	270	270	270
Mozambique	50%	--	--	--	--	300	1,000	1,000
Nigeria	36% to 56%	20	23	25	18	--	500	1,900
Sierra Leone	58% to 65%	--	--	3,600	11,900	7,300	10,400	14,400
South Africa	62% to 65%	24,900	36,900	42,000	42,500	52,000	54,000	55,000
Swaziland	44.5%	--	--	460	530	--	--	--
Tanzania	52%	--	--	--	--	--	520	1,500
Togo	30%	--	--	16	15	15	15	15
Tunisia	54%	108	94	117	127	100	100	100
Uganda	61% to 67%	--	2	3	3	12	220	330
Zambia	65%	--	--	--	--	10	100	200
Zimbabwe ²	51%	185	--	--	--	--	--	100
Total		33,900	46,000	58,100	68,600	84,000	150,000	180,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²Average iron content for Zimbabwe prior to 1996 was 61%; since 1996, the average grade has been 51%.

TABLE 12
AFRICA: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 2005–2020¹

(Thousand metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Algeria	1,007	662	557	440	3,000	3,000	4,000
Congo (Kinshasa)	110	NA	NA	NA	NA	NA	NA
Egypt	5,565	6,700	6,627	6,754	12,000	12,000	12,000
Ethiopia	60	150	130	130	730	1,700	1,700
Kenya	--	290	340	400	400	400	400
Libya	1,255	825	315	715	1,000	2,000	2,000
Mauritania	1	5	5	5	10	10	10
Morocco	205	485	539	558	600	600	600
Nigeria	100	100	400	400	400	400	400
South Africa	9,494	7,617	6,938	7,200	7,600	10,000	12,000
Tanzania	--	--	--	--	200	600	1,300
Tunisia	66	115	109	109	200	200	200
Uganda	30	59	60	64	70	260	360
Zambia	--	40	50	55	100	100	200
Zimbabwe	107	14	15	15	15	15	15
Total	18,000	17,100	16,100	16,800	26,000	31,000	35,000

^cEstimated. NA Not available. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 13
AFRICA: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 2005–2020¹

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Botswana	39,335	24,931	17,948	22,842	21,000	21,000	21,000
Burundi	--	--	--	--	5,700	5,700	11,000
Madagascar	--	--	8,300	27,000	63,000	63,000	63,000
Morocco	99	317	288	175	300	300	300
South Africa	42,392	39,960	45,945	51,208	58,000	68,000	87,000
Zambia	--	2,482	--	--	--	5,000	40,000
Zimbabwe	8,556	6,200	7,899	14,058	15,000	15,000	15,000
Total	90,400	73,900	80,400	115,000	160,000	180,000	240,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 14
AFRICA: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 2005–2020¹

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Botswana	NA	3,328	2,613	1,337	1,100	1,100	1,100
Burundi	--	--	--	--	110	550	1,100
South Africa	82,961	82,222	74,738	76,008	85,000	97,000	120,000
Zimbabwe	3,879	7,000	7,800	10,153	10,000	13,000	13,000
Total	86,800	92,600	85,200	87,500	96,000	110,000	140,000

^cEstimated. NA Not available. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 15
AFRICA: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 2005–2020¹

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Botswana	NA	560	435	218	190	190	190
Burundi	--	--	--	--	60	300	600
Ethiopia	--	8	--	--	--	--	--
South Africa	163,711	147,790	128,590	137,024	150,000	170,000	190,000
Zimbabwe	4,834	8,800	10,500	13,066	13,000	16,000	16,000
Total	169,000	157,000	140,000	150,000	160,000	190,000	210,000

^cEstimated.. NA Not available. -- Negligible or no production

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 16
AFRICA: HISTORIC AND PROJECTED TIN MINE PRODUCTION, 2005–2020¹

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Burundi	4	12	50	1	3	3	3
Congo (Kinshasa)	4,400	8,000	4,800	3,700	6,600	15,000	16,000
Egypt	--	--	100	111	2,200	2,200	2,200
Morocco	--	--	--	--	5,300	5,300	5,300
Niger	14	6	--	--	--	--	--
Nigeria	1,300	520	570	570	600	600	600
Rwanda	170	3,300	2,900	3,100	6,000	7,000	7,000
Uganda	--	32	--	20	20	20	20
Total	5,890	11,900	8,420	7,500	21,000	30,000	31,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 17
AFRICA: HISTORIC AND PROJECTED TIN METAL PRODUCTION, 2005–2020¹

(Metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Congo (Kinshasa)	--	--	--	--	1,800	1,800	11,000
Nigeria	25	--	--	--	--	--	--
Rwanda	200	--	--	--	2,200	2,200	2,200
Total	230	--	--	--	4,000	4,000	13,000

^cEstimated. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

TABLE 18
AFRICA: HISTORIC AND PROJECTED DIAMOND PRODUCTION, 2005–2020¹

(Thousand carats)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Angola	7,079	8,362	8,331	9,360	9,200	9,700	10,000
Botswana	31,890	22,019	20,550	23,190	27,000	27,000	27,000
Cameroon	12	6	5	3	5	5	5
Central African Republic	383	302	366	--	250	350	350
Congo (Brazzaville)	--	381	52	56	70	70	70
Congo (Kinshasa)	35,207	16,964	22,093	18,045	17,000	21,000	21,000
Côte d'Ivoire	300	--	--	--	10	100	150
Gabon	(2)	NA	NA	NA	--	--	--
Ghana	1,013	334	233	169	200	300	450
Guinea	549	374	267	202	200	250	250
Lesotho	52	104	479	414	400	600	600
Liberia	NA	27	42	44	40	40	40
Namibia	1,902	1,693	1,629	1,689	1,900	1,900	1,900
Sierra Leone	669	438	541	609	620	650	650
South Africa	15,776	8,868	7,250	8,168	9,400	10,000	10,000
Tanzania	220	80	127	180	270	310	310
Togo	41	(2)	(2)	(2)	(2)	(2)	(2)
Zimbabwe	251	8,435	12,060	10,412	8,000	8,000	6,000
Total	95,300	68,400	74,000	72,500	75,000	80,000	79,000

^cEstimated. NA Not available. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²Less than 1 unit.

TABLE 19
AFRICA: HISTORIC AND PROJECTED LITHIUM PRODUCTION, 2005–2020

(Metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Zimbabwe	1,100	47,000	53,000	50,000	50,000	50,000	50,000

^cEstimated data are rounded to no more than three significant digits.

TABLE 20
AFRICA: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 2005–2020¹

(Thousand metric tons)

Country	2005	2010	2012	2013	2016 ^c	2018 ^c	2020 ^c
Botswana	985	988	1,455	1,496	2,300	6,000	12,000
Congo (Kinshasa)	120	--	4	4	4	1,300	2,000
Egypt	300	NA	NA	NA	NA	NA	NA
Ethiopia	--	20	20	20	40	150	200
Malawi	52	65	92	98	180	180	180
Mozambique	3	38	4,954	6,343	21,000	37,000	47,000
Niger	182	247	235	242	250	250	250
Nigeria	8	46	40	40	50	50	50
South Africa	244,940	254,522	259,012	256,282	280,000	300,000	330,000
Swaziland	222	146	152	205	200	200	200
Tanzania	31	(2)	79	129	370	2,200	5,500
Zambia	240	200	200	200	300	300	300
Zimbabwe	2,891	2,668	3,500	4,980	5,000	6,000	6,000
Total	250,000	259,000	270,000	270,000	310,000	350,000	400,000

^cEstimated. NA Not available. -- Negligible or no production.

¹Estimated data and totals are rounded to no more than three significant digits.

²Less than 1 unit.