



2012 Minerals Yearbook

SUDAN

THE MINERAL INDUSTRY OF SUDAN

By Thomas R. Yager

The mineral sector's influence on Sudan's economy was significant because of petroleum production and refining. In recent years, cement and gold production became more significant to the Sudanese economy. In 2012, Sudan played a significant role in the global production of gold, accounting for nearly 2% of the world's gold mine output. Sudan was not a globally significant consumer of mineral commodities in 2012 (George, 2013).

In January 2011, the autonomous region of Sudan, which was known as Southern Sudan, and was composed of the States of Central Equatoria, Eastern Equatoria, Jonglei, Lakes, Northern Bahr el Ghazal, Unity, Upper Nile, Warrap, Western Bahr el Ghazal, and Western Equatoria, held a referendum on independence from Sudan. The people of Southern Sudan voted for secession, and the new country became independent with the name of the Republic of South Sudan on July 9, 2011. As a result of the referendum, the oilfields were divided between South Sudan and Sudan, but control of the Abyei Area was disputed by the Governments of South Sudan and Sudan. In April 2012, South Sudan and Sudan engaged in armed conflict in Abyei (U.S. Office of Foreign Assets Control, 2011; Africa Energy Intelligence, 2012c; Kushkush, 2013).

Investment in Sudan's petroleum and petrochemical industries by U.S. individuals and organizations was banned by Executive Order 13412, which was issued by the President of the United States on October 13, 2006. The alleged use of revenues from petroleum sales to finance military operations in the Darfur conflict constituted one of the reasons for the Executive Order. U.S. individuals and organizations were banned from participating in the refining of South Sudanese crude petroleum in refineries located in Sudan (Bush, 2006; U.S. Office of Foreign Assets Control, 2011).

Minerals in the National Economy

In 2012, the manufacturing sector accounted for 15% of the gross domestic product (GDP) of Sudan; petroleum, 3.3%; and mining and quarrying, 0.4%. The value of output in the mining and quarrying sector increased by 105% compared with that of 2011, and the value of petroleum output decreased by 50%. In 2011, the petroleum sector accounted for 6.7% of the GDP (Bank of Sudan, 2013a, p. 118).

In 2012, gold exports were valued at \$2.16 billion, or 64% of total exports, and petroleum products were valued at \$256 million, or 8% of total exports. The United Arab Emirates received nearly 96% of Sudan's gold exports. Sudan reported no crude petroleum exports in 2012. In 2011, crude petroleum exports were valued at \$7 billion, or 72% of total exports; gold, 15%; and petroleum products, 3% (Bank of Sudan, 2012, p. 14; 2013b, p. 12, 18).

Production

In 2012, gypsum production increased by 801%; feldspar, by 176%; salt, by 144%; gold, by 94%; and cement, by 16%. Marble production decreased by 91%; chromite, by 71%; crude petroleum, by 64%; kaolin, by 23%; and mica, by 14% (table 1).

Structure of the Mineral Industry

Sudan's crude petroleum was produced by joint ventures of state-owned companies from China, India, Malaysia, and Sudan. The petroleum refineries were also state owned; the Khartoum Oil Refinery was a joint venture between Chinese Government-owned China National Petroleum Corp. (CNPC) and the Government of Sudan's Sudan Petroleum Corp. The Government of Sudan held a 56% share in the Hassai gold mine; gold was also produced by an estimated 250,000 artisanal miners (Laessing, 2012a). The cement plants were privately owned.

Commodity Review

Metals

Copper, Gold, and Silver.—Artisanal miners accounted for most of Sudan's gold production. In 2012, national gold exports increased to 46,133 kilograms (kg) from 23,739 kg in 2011 and 6,049 kg in 2007. Most artisanal gold mining operations were located in the northern part of the country. Mining was becoming more expensive as near-surface deposits were depleted (Bank of Sudan, 2012, p. 14; 2013b, p. 12; Laessing, 2012a).

Since 1991, La Mancha Resources Inc. of Canada had produced about 72,000 kg of gold at the Hassai Mine in northeastern Sudan. La Mancha produced 2,231 kg in 2011 compared with 2,129 kg in 2010; the company expected output to decrease by 16% in 2012 because of the depletion of near-surface oxide deposits (Laessing, 2012a; La Mancha Resources Inc., 2012; Saywell, 2012).

In February, La Mancha announced an updated resource estimate for the Hassai volcanogenic massive sulfide (VMS) deposit located under the oxide deposits. Resources were estimated to be nearly 118 million metric tons (Mt) at grades of 1.11% copper, 0.64% zinc, and 1.23 grams per metric ton gold. La Mancha planned further exploration at the Hassai VMS deposit (Saywell, 2012).

The Government planned to increase gold production to offset the loss of crude petroleum production from the secession of South Sudan. By the end of 2011, the Government had awarded 200 gold exploration licenses to 73 companies. In September, the Government completed a new refinery in Khartoum with a capacity of 328,000 kilograms per year (kg/yr) of gold and 73,000 kg/yr of silver (African Business, 2011; Gold Mining Journal, 2012).

Industrial Minerals

Cement.—Sudan had seven cement plants with a combined capacity of 10.1 million metric tons per year (Mt/yr). National cement production increased to nearly 3.48 Mt in 2012 from 3 Mt in 2011 and 246,500 metric tons (t) in 2008. Output increased because of the expansion of Al-Rajhi Group's Atbara plant and the opening of five new plants from 2008 to 2011 (International Cement Review, 2011; Bank of Sudan, 2013a, p. 142).

In 2012, Al-Rahji Group produced about 1.12 Mt of cement; ASEC Cement Co. of Egypt (a subsidiary of Citadel Capital S.A.E. of Egypt), 690,800 t; Berber Cement Co., 605,700 t; Al-Shamal Cement Factory, 551,600 t; Al-Salam Cement Production Company Ltd., 288,300 t; Nile Cement Company Ltd., 149,100 t; and Aslan Cement Co., 68,700 t. The increase in production was broadly based in 2012, with output increasing at all plants except for ASEC and Aslan (Bank of Sudan, 2013a, p. 142).

Mineral Fuels

Natural Gas.—Most natural gas associated with crude petroleum was reinjected or flared. In recent years, only a limited amount exploration for natural gas has been conducted in Sudan (African Power Mining & Oil Review, 2012).

Petroleum.—In 2012, Sudan's production of crude petroleum decreased to about 37.7 million barrels (Mbbbl) from 106.2 Mbbbl in 2011 and 168.7 Mbbbl in 2010. The decrease in output was attributable to the secession of South Sudan. Historically, production was limited by low recovery rates; the average recovery rate of oil in place was 23% compared with the worldwide average of 30% (European Coalition on Oil in Sudan, 2010, p. 18–19).

The Greater Nile Petroleum Operating Co. [CNPC (40%), Petronas Carigali Overseas Shd. Bhd. of Malaysia (30%), ONGC Videsh Ltd. of India (25%), and Sudan Petroleum Company Ltd. (Sudapet) (5%)] produced crude petroleum in Blocks 1, 2, and 4 in south-central Sudan. After the referendum on South Sudan's independence, Blocks 1, 2, and 4 were divided between Sudan and South Sudan. The Bamboo, the Bamboo West, the Garaad, the Heglig, the Taiyib, and the Toma oilfields are located north of the national boundary and remained in Sudan. The El-Haar, the El-Nar, the El-Toor, the Khairat, the Khairat Northeast, the Toma South, and the Unity oilfields are located in South Sudan (European Coalition on Oil in Sudan, 2010, p. 25).

In 2012, production from the oilfields north of the national boundary in Blocks 1, 2, and 4 was reported to be about 48,400 barrels per day (bbl/d). Production has declined since 2004 because of insufficient investment and maturing oilfields. In April, damage to the Heglig oilfield and its processing plant resulting from the conflict regarding Abyei also contributed to decreased production. Oilfields in Blocks 2 and 4 that were not damaged were also shut down during the conflict (Africa Energy Intelligence, 2012c; African Power Mining & Oil Review, 2012; Laessing, 2012b; Sudanese Petroleum Corp., 2013).

CNPC held Block 6, which is located to the northwest of Muglad in northern Sudan. In 2012, production was reported to be about 54,600 bbl/d compared with 59,100 bbl/d in 2011. The new Hadida oilfield in Block 6 was expected to start production in late December 2012 and to produce 10,000 bbl/d (Laessing, 2012b; Sudanese Petroleum Corp., 2013).

In late 2012, Star Oil Co. (Ansan Wikfs Investments Ltd. of Yemen, 66%, and Sudapet, 34%) started production at the South Annajma oilfield in Block 17. Star Oil planned to produce 15,000 bbl/d at South Annajma, which is located north of Block 6, by the end of 2013 (Africa Energy Intelligence, 2013; Sudanese Petroleum Corp., 2013).

In early 2012, Al-Qahtani Group of Saudi Arabia and Ansan Wikfs Group of Yemen drilled an exploration well at Block 12A in western Sudan. The companies planned further exploration in 2013. The Government offered Blocks 8, 10, 12B, 14, 15, and 18 for tender at the end of 2011. Block 8 was relinquished by Petronas and its joint-venture partners in 2010 after discoveries of natural gas were deemed to be subeconomic. Block 15 was relinquished by CNPC and its joint-venture partners in 2010 (Africa Energy Intelligence, 2012a, b).

CNPC operated the Khartoum Oil Refinery at Jali in northern Sudan with a capacity of 100,000 bbl/d; the company accounted for most of Sudan's refined petroleum products output. In 2012, national output of refined petroleum products decreased by 8.3%. The damage in Blocks 2 and 4 that resulted from the conflict between South Sudan and Sudan led to decreased production at the Khartoum Oil Refinery (Africa Energy Intelligence, 2012c).

Outlook

Sudan's crude petroleum production could increase in 2013 because of expansions in Blocks 6 and the startup of production in Block 17; several small oilfields also could be developed in Block 17. The increases are likely to be at least partially offset by decreasing production from mature wells in Blocks 1, 2, and 4. Without new investment, Sudanese production could decline to about 50,000 bbl/d by 2018. Higher levels of production may be sustained with new discoveries or increased recovery rates. Crude petroleum production, especially in Blocks 2 and 4, depends on the resolution of disputes regarding the Abyei Area (European Coalition on Oil in Sudan, 2011, p. 10; Africa Energy Intelligence, 2013).

Large-scale gold mining projects are expected to take between 3 and 5 years to start production. The development of large-scale gold mines could be constrained by high royalty rates and transportation costs and economic sanctions. The outlook for chromite production depends heavily upon world stainless steel markets (Laessing, 2012a).

References Cited

- Africa Energy Intelligence, 2012a, A first well in Darfur: Africa Energy Intelligence, no. 667, January 18. (Accessed November 20, 2013, at <http://www.africaintelligence.com/AEM/oil/2012/01/18/a-first-well-in-darfur,96883845-ART.>)
- Africa Energy Intelligence, 2012b, Khartoum needs higher output: Africa Energy Intelligence, no. 666, January 4. (Accessed November 20, 2013, at <http://www.africaintelligence.com/AEM/oil/2012/01/04/khartoum-needs-higher-output,96280887-ART.>)

- Africa Energy Intelligence, 2012c, War to cost Khartoum a mint: Africa Energy Intelligence, no. 675, May 16. (Accessed November 20, 2013, at <http://www.africaintelligence.com/AEM/government-strategies/2012/05/16/war-to-cost-khartoum-a-mint,101934561-BRE.>)
- Africa Energy Intelligence, 2013, New block starts producing: Africa Energy Intelligence, no. 696, April 2. (Accessed November 20, 2013, at <http://www.africaintelligence.com/AEM/oil/2013/04/02/new-block-starts-producing,107952225-ART.>)
- African Business, 2011, Sudan moves from oil to gold: African Business, no. 381, December, p. 12.
- African Power Mining & Oil Review, 2012, Oil production stuck in talks: African Power Mining & Oil Review, Second quarter, p. 64–66.
- Bank of Sudan, 2012, Foreign trade statistical digest—October–December 2011: Khartoum, Sudan, Bank of Sudan, 43 p.
- Bank of Sudan, 2013a, 51st annual report 2012: Khartoum, Sudan, Bank of Sudan, 170 p.
- Bank of Sudan, 2013b, Foreign trade statistical digest—October–December 2012: Khartoum, Sudan, Bank of Sudan, 41 p.
- Bush, G.W., 2006, Blocking property of and prohibiting transactions with the Government of Sudan—Executive Order 13412 of October 13, 2006: Federal Register, v. 71, no. 200, October 17, p. 61369.
- European Coalition on Oil in Sudan, 2010, Sudan's oil industry on the eve of the referendum: Utrecht, Netherlands, European Coalition on Oil in Sudan, 30 p.
- European Coalition on Oil in Sudan, 2011, Sudan's oil industry after the referendum—Conference report: Utrecht, Netherlands, European Coalition on Oil in Sudan, 23 p.
- George, M.W., 2013, Gold: U.S. Geological Survey Mineral Commodity Summaries 2013, p. 66–67.
- Gold Mining Journal, 2012, Sudan opens its first gold refinery: Gold Mining Journal, v. 1, no. 109, October–December, p. 15.
- International Cement Review, 2011, North Africa—Potential unlocked: International Cement Review, August, p. 116–126.
- Kushkush, Isma'il, 2013, Sudans sign agreement to resume oil exports: The New York Times, March 13, p. A4.
- Laessing, Ulf, 2012a, Sudan's last hope: Australia's Paydirt, v. 1, no. 198, September, p. 58.
- Laessing, Ulf, 2012b, Update 1—Sudan adds 10,000 bpd with new oilfield—State media: Chicago Tribune, December 26. (Accessed November 20, 2013, at http://articles.chicagotribune.com/2012-12-26/news/sns-rt-sudan-oil-update-115e8nq3w9-20121226_1_heglig-south-sudan-sudan-side.)
- La Mancha Resources Inc., 2012, La Mancha meets its 2011 gold production forecast: Montreal, Quebec, Canada, La Mancha Resources Inc. press release, January 19, 2 p.
- Saywell, Trish, 2012, Doubled Hassai resource creates buzz for La Mancha: The Northern Miner, v. 98, no. 3, March 5–11, p. C5, C8.
- Sudanese Petroleum Corp., 2013, Crude oil & products statistics: Sudanese Petroleum Corp. (Accessed June 6, 2013, at http://www.spc.sd/en/statics_crude.php.)
- U.S. Office of Foreign Assets Control, 2011, 31 CFR part 538 Sudanese sanctions regulations; final rule: Federal Register, v. 76, no. 236, December 8, p. 76617–76619.

TABLE 1
SUDAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012
Cement, hydraulic	246,500	621,700	1,929,700 ^r	3,002,300 ^r	3,476,600
Chromite, mine output, gross weight ³	27,094	14,087	56,823	64,128 ^r	18,300
Gold, mine output, Au content ⁴ kilograms	7,508	14,914	26,317	23,739	46,133
Feldspar	NA	--	923	9,519	26,283
Gypsum	12,705	30,000	31,000	13,000 ^r	117,073
Kaolin	87,151	36,799	32,696	15,096 ^r	11,579
Manganese ore	--	500	-- ^r	-- ^r	--
Marble square meters	1,600	--	1,625 ^r	1,214 ^r	115
Mica	66	100	10	378 ^r	324
Petroleum:					
Crude, including lease condensate ⁵ thousand 42-gallon barrels	168,898	173,453	168,656	106,216 ^r	37,737
Refinery products:					
Liquefied petroleum gas do.	3,332	3,915	3,798	3,617 ^r	3,515
Gasoline do.	9,244	9,488	10,593	9,811 ^r	9,381
Naphtha do.	219	207	180	177 ^r	71
Jet fuel do.	836	981	1,059	1,062 ^r	1,068
Kerosene do.	251	240	196	186 ^r	62
Distillate fuel oil do.	13,903	19,115	17,489	15,460 ^r	14,669
Residual fuel oil do.	4,534	2,108	1,732	1,830 ^r	663
Petroleum coke do.	1,632	1,713	1,774	1,571 ^r	1,477
Total do.	33,951	37,767	36,821	33,714 ^r	30,906
Salt	10,581	35,793	141,840	10,791 ^r	26,315
Silver kilograms	--	413	631	650 ^{r,e}	650 ^e
Steel, semimanufactured ^c	350,000 ^r	380,000 ^r	400,000 ^r	400,000 ^r	400,000
Talc	4,667	1,167	--	--	--

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through October 31, 2013.

²In addition to the commodities listed, the following are presumably produced although available information is inadequate to estimate output: clay and (or) shale for cement manufacture [normally about 0.4 metric ton of clay and (or) shale per metric ton of finished cement]; limestone for agriculture, cement manufacture (normally 1.4 metric tons per metric ton of finished cement), construction aggregate and fill, and lime manufacture; and other construction materials (clays, sand and gravel, stone, and others for local use).

³Presumed to be ores and concentrates with an estimated average grade of about 54% chromic oxide.

⁴Reported exports.

⁵For 2011, South Sudanese production included only for the period before independence on July 9.

TABLE 2
SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2012¹

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Atbara Cement Company Ltd. (subsidiary of Al-Rajhi Group)	Plant at Atbara	1,800,000
Do.		ASEC Cement Co. (subsidiary of Citadel Capital S.A.E.)	Plant at Takamol	1,600,000
Do.		Berber Cement Company Ltd.	Plant at Berber	1,600,000
Do.		Aslan Cement Co.	NA	1,500,000 ^e
Do.		Al-Shamal Cement Factory (Mass Global Investment Co.)	Plant at Atbara	1,500,000
Do.		Nile Cement Company Ltd.	Plant at Rabak	1,500,000
Do.		Al-Salam Cement Production Co. Ltd.	Plant at Atbara	600,000
Chromite		Ingessana Hills Mines Corp.	Mine at Ingessana Hills	48,000
Gold:				
Mine	kilograms	Artisanal miners	Various sites	45,000 ^e
Do.	do.	Compagnie Miniere Or (Government of Sudan, 56%, and La Mancha Resources Inc., 40%)	Mine at Hassai	2,000
Refined	do.	Government of Sudan	Refinery at Khartoum	328,000
Gypsum		Sudanese Mining Corp. (Government of Sudan, 100%)	Bir Eit Mine in Red Sea State	15,000
Limestone		Al-Salam Cement Production Co. Ltd.	Mine in River Nile State	730,000 ^e
Do.		Al-Rajhi Group	Mine at Atbara	500,000
Do.		Nile Cement Company Ltd.	Mine at Rabak	200,000
Mica		Sudanese Mining Corp. (Government of Sudan, 100%)	Mines at Sheriek	1,800
Petroleum:				
Crude	thousand 42-gallon barrels	China National Petroleum Corp., 95%	Block 6 near Muglad	21,600
Do.	do.	Greater Nile Petroleum Operating Co. [China National Petroleum Corp. (CNPC), 40%; Petronas Carigali Overseas Shd. Bhd., 30%; ONGC Videsh Ltd., 25%; Sudan Petroleum Company Ltd. (Sudapet), 5%]	Blocks 1, 2, and 4 in Unity State ²	17,700
Do.	do.	Star Oil Co. [Ansan Wikfs Investments Ltd., 66%, and Sudan Petroleum Company Ltd. (Sudapet), 34%]	Block 17 in South Kordofan State	5,500
Refined	do.	Khartoum Oil Refinery [China National Petroleum Corp. (CNPC), 50%, and Sudan Petroleum Company Ltd. (Sudapet), 50%]	Refinery at Jali	36,500
Do.	do.	Port Sudan Refining Ltd. (Government of Sudan, 100%)	Refinery at Port Sudan	9,100
Do.	do.	El-Obeid Refinery Company (Government of Sudan, 100%)	Refinery at El-Obeid	5,500
Salt		Bittar Salt Company Ltd. (subsidiary of El-Nilein Holding Co.)	Mine at Port Sudan	100,000
Do.		Sudan Salt Co.	do.	45,000 ^e
Do.		Ba'boud Salt Co.	do.	30,000 ^e
Silver, refined	kilograms	Government of Sudan	Refinery at Khartoum	73,000
Steel:				
Crude		Sudan Master Technology	Plant at Giad Industrial City	60,000
Rebar		do.	do.	150,000
Do.		Sudanese Steel Products Ltd. (subsidiary of Hafez Elsayad Barbary Ltd.)	Plant at Khartoum	150,000
Galvanized		do.	do.	20,000

^eEstimated. Do., do. Ditto. NA Not available.

¹In addition to the facilities listed, about 1.8 million barrels per year of crude petroleum were produced in the Abyei Area, which was claimed by both South Sudan and Sudan.

²Bamboo, Bamboo West, Garaad, Heglig, Taiyib, and Toma oilfields only. Prior to July 9, 2011, capacity was 47 million barrels per year and included the El-Haar, the El-Nar, the El-Toor, the Khairat, the Khairat Northeast, the Toma South, and the Unity oilfields, which became part of South Sudan.