



2007 Minerals Yearbook

TUNISIA

THE MINERAL INDUSTRY OF TUNISIA

By Mowafa Taib

Phosphate rock and phosphate-based fertilizers continued to be Tunisia's main contributions to the world mineral markets. Tunisia maintained its ranking as the world's fifth ranked producer of phosphate rock in 2007. It accounted for 5.2% of the world supply of phosphate rock. Furthermore, its large sedimentary deposits of marine phosphorites placed Tunisia among the 10 leading countries in the world in the estimated size of phosphate rock reserves. Most of the phosphate rock output was processed locally to manufacture phosphate-based fertilizers, including diammonium phosphate, phosphoric acid, and triple superphosphate.

In 2007, Tunisia was a minor producer of petroleum and ranked 11th among African producers of crude oil despite its record production of 35 million barrels (Mbbl), which was about 39.5% higher than that of 2006. The increase in crude oil production, which was attributable to the entry of new oilfields into the production phase, offset the national energy deficit caused by increased consumption and a drop in natural gas production (BP p.l.c., 2008, p. 9, Jasinski, 2008; Tunisian National Oil Co., 2008, p. 16, 17).

Minerals in the National Economy

The mining sector's share of the gross domestic product (GDP) at 2007 prices was 0.5%, which was down from 0.6% in 2006; the share of the hydrocarbon sector was 5.3% of the GDP at current prices compared with 2.9% and 4.7% in 2003 and 2006, respectively. Fuel and industrial minerals played a vital part in Tunisia's external trade. The value of energy exports was 16.2% of total exports compared with 13.0% in 2006, which was mainly owing to the 68% increase, in terms of value, in crude oil exports. The value of phosphate products exports accounted for 6.5% of total exports and that of manufactured building materials was 1.7%. The added value, in real terms, of mining activities was 0.8% in 2007 compared with -7.0% in 2006. The value of the hydrocarbon sector, on the other hand, increased by 22.5% compared with a decrease of 4.6% in 2006. Overall, the combined value of building materials, energy, mining, and phosphate products exports was 24.9% of the total export value (Central Bank of Tunisia, 2008, p. 59, 117).

The expansion of hydrocarbon operations in the country came as a positive response to Government planning and to the flow of foreign direct investment into the country, 74% of which went to energy sector projects. Tunisia ranked 73d among 181 world economies in the ease of doing business, according to the World Bank's Doing Business 2009 report. Reforms aimed at facilitating starting a business, obtaining credit, and registering properties were mainly the cause of the move upward in the ranking from 81st in the previous year (World Bank, The, 2008, p. 6).

The Mining Code (law No. 2003-30 of April 28, 2003) regulated mineral exploration and production activities in Tunisia, and oil and gas production were governed by the

Hydrocarbons Code (law No. 99-93 of August 17, 1999) and its supplement (law No. 2002-23 of February 2002). The licensing allows for a prospecting period of 1 year, a maximum of 5 years for exploration, and 30 years of production. It also allows for lowering the tax rate to 50% from 75% if state-owned, Tunisian National Oil Company (also known by its French acronym, ETAP) receives a 40% share of the concession.

Production

In 2007, mine production of aluminum fluoride increased by 8.0%, phosphate rock production increased by 2.6%, and cement production increased by 1.7% compared with 2006 production levels. Iron ore mine output decreased by 15.9%, however, and sea salt production was down by 17.2% during the same period. Moreover, no production had been reported for barite, lead, and zinc ores since 2005, when mining activity for these commodities was halted as a result of low profitability. Production of cement reached 7 million metric tons (Mt) in 2007, but the quantity of white cement produced [316,000 metric tons (t)] was 1.8% lower than that of 2006. Manufacturing of other building materials, such as mosaic and earthenware tiles, continued its steady growth, with output increasing by more than 4%; clay products output increased by 3% (Central Bank of Tunisia, 2008, p. 69).

Crude oil production totaled 35.1 Mbbl in 2007 compared with 25.2 Mbbl in 2006. This increase came primarily from increased production at the Didon and the Oudna oilfields. The gross output of natural gas operations, which had peaked in 2005 at 2,343 million cubic meters, dropped to 2,150 million cubic meters, which represented decreases of 4% and 8% compared with outputs in 2006 and 2005, respectively (Central Bank of Tunisia, 2008, p. 64, 65).

Structure of the Mineral Industry

All the phosphate mining and fertilizer manufacturing activities in Tunisia were carried out entirely by the Government-owned establishment, Gafsa Phosphate Company, which was also known by its French acronym, CPG. Much of the cement sector had been privatized in the 1990s, which resulted in the creation of local companies and the entry of European and regional companies into cement production. Private companies produced crude construction materials. The Government pursued policies to encourage more international companies to work in Tunisia and to help local small- and medium-sized industrial businesses compete with international companies.

ETAP expanded its production partnerships with several international oil companies and monitored their exploration and production operations to protect the interests of the Government in the hydrocarbon sector. In 2007, ETAP awarded eight new licenses that included four exploration permits (the El Fahs, the

Remada, the Tajerouine, and the Zaafrane) and four prospecting permits (the Jenein Center, the Mahdia, the Metouia, and the Western Douleb). At the end of 2007, the number of valid permits was 50, which included 17 offshore locations. Twenty exploration and appreciation wells were drilled and 10 discoveries were reported compared with 9 wells and 4 discoveries in the previous year. The total investment in the oil sector reached \$343 million, which was up from \$205 million in 2006. The work was performed by 45 local and international companies (Central Bank of Tunisia, 2008, p. 64; Tunisian National Oil Co., 2008, p. 20).

Commodity Review

Metals

Iron and Steel.—Iron ore production amounted to 180,000 t in 2007 compared with 214,000 t in 2006. This substantial reduction was attributable to the diminishing hematite reserves at the Djerissa and the Tamera Mines in Sedjnane. Sales of iron ore to the local market by state-owned Tunisian Steel Manufacturing Co., also known by its short Arabic name, El-Fouladh, were 18.8% lower than in 2007. This shortage had prompted El-Fouladh to import 13,600 t of iron ore in 2007 compared with 17,000 t in 2006 to meet the growing demand from the Tunisian steel industry, which was expected to reach 1 Mt by 2010 (Arab Steel, 2008a; Central Bank of Tunisia, 2008, p. 61). El-Fouladh increased the production capacity of its first electric arc furnace to 100,000 metric tons per year (t/yr) from 65,000 t/yr of crude steel. The company began constructing a second electric arc furnace with a similar capacity; construction was expected to be finished in the third quarter of 2008. Moreover, Tunisian Government officials held talks with representatives of Global Steel Holdings Ltd. in India to raise funds to develop the Tunisian steel industry. The talks were aimed at inviting the Indian company to take stakes in El-Fouladh, which was Tunisia's leading steelmaker (Mineweb, 2007; Arab Steel, 2008b).

Lead and Zinc.—In December 2007, the National Office of Mines (ONM) estimated the mineral resources of combined zinc and lead at cutoff grades of 1%, 2% and 4% for the Gite de l'Est zinc-lead-barite-fluorite mine at Bou Jabeur to be on the order of 4.6 million cubic meters in volume and 16.2 Mt in mass. Maghreb Minerals p.l.c. acquired 90% interest in the Bou Jabeur and the Fej Lahdoum exploration permits in 2007 following the results of drilling that confirmed the presence of sizable lead-zinc mineralization. With this latest acquisition, Maghreb Minerals had 11 exploration licenses that covered 302 square kilometers (km²) in the Majerda Zone, which is located in the northwestern part of Tunisia. These licenses also included the Djebbel Goraa, the Hammala, the Koudiat Louatia, the Ouled Moussa, and the Zaghoun sites. Breakwater Resources Ltd. of Canada, which operated Bougrine Mine until its closure in 2005, left its mill in place awaiting the results of Maghreb Minerals' exploration in the area (Hanson Westhouse Ltd., 2007; Maghreb Minerals p.l.c., 2007, 2008).

The joint venture of Albidon Ltd. and Zinifex Ltd. (which was to merge with Oxiana Ltd. to form AZ Minerals in

2008) identified geochemical and geophysical targets in the Nefza exploration permit in 2006 and conducted 8,000 to 10,000 meters (m) of diamond drilling at five prospected sites. Drilling at Bou Aouane continued, and the induced polarization surveys at El Haouaria, the Jebel Touila, and the Jebel Trozza were completed. In May 2007, Zinifex also acquired the Huffouz permit, which included the Jebel Touila and the Jebel Trozza base-metal prospects that covered a 428-km² area (Zinifex Ltd., 2007, 2008).

Industrial Minerals

Cement.—Cementos de Portugal SGPS, S.A. (Cimpor) announced plans to increase its production capacity at the Jebel Oust plant to 2.4 million metric tons per year (Mt/yr) by building an additional clinker production line. The expansion would help the company meet the increasing demand for cement by the local market (Global Cement Magazine, 2008).

A contract to build a new white cement plant with a 1,000-metric-ton-per-day (t/d)-capacity in the Feriana (Kasserine) works in west-central Tunisia was given to Polysius AG (a subsidiary of Thyssenkrupp Technologies AG of Germany) by Société Tuniso-Andalouse de Ciment Blanc (SATOCIB). Production was expected to begin in 2009 (Polysius AG, 2007).

Tunisia's Ciment Karthago Co. entered into a joint-venture agreement with an unnamed Spanish company to build a new cement plant at Akarit, which is located north of the city of Gabes. The plant was expected to produce 600,000 t of cement and 1.5 Mt of clinker beginning in 2009. Seventy percent of the production would be sold locally; the remaining 30% was earmarked for export (Global Cement Magazine, 2007).

Global Investment House (GIH), which was a Kuwaiti investment company, signed a pact with Bina Holding of Tunisia to create a cement plant with 2 Mt/yr of production capacity. Moreover, GIH purchased a quarry area that covered 220 hectares, which was estimated to contain 250 Mt of high-grade limestone (Gulf News, 2008).

Fluorspar.—The improvement in the world fluorite prices prompted an interest in the past-producing fluorite mines and fluorspar deposits in Tunisia. Maghreb Minerals conducted verification drilling in the Zaghounan fluorite zone, which is located 60 kilometers south of Tunis City, from May through September 2007. The drilling, which used two rigs, included 15 holes covered 2,150 m of the Guebli deposit, which is located west of the Zriba Mine. The results of drilling established the existence of high grades of fluorite mineralization that ranged from 4% to 48% of CaF₂ (average of 25%) that varied in thickness between 0.6 and 10.5 m. The Zriba Mine, which was shut down in the 1990s because of the decline in fluorite prices, used to produce 35,000 to 40,000 t/yr of ore containing 25% CaF₂ between 1967 and 1992. ONM expected the outstanding mineral resources in the southern part of the Zriba Mine at the Guebli deposit to be about 4 Mt of ore, including about 850,000 t of reserves (African Mining, 2007, p. 25; Hanson Westhouse Ltd., 2007; Maghreb Minerals p.l.c., 2008).

Phosphate Rock.—CPG was responsible for mining 12.4 Mt of raw phosphate from seven open quarries and one underground mine. Other underground mines were

permanently closed after they were contracted out because of low profitability. The quarries at Kef Eddour, Kef Eschfair, and Jallabia together produced 58% of the country's total phosphate rock extracted in 2007. About 1.2 Mt of phosphate rock was exported and the rest was either sold locally or stockpiled awaiting future sale (Central Bank of Tunisia, 2008, p. 61). The Tunisian Chemical Group (GCT), which was the fertilizer manufacturing wing of CPG, processed phosphate rock at its four industrial sites in Gabes, M'Dhilla, Sfax, and Skhira.

Mineral Fuels

Natural Gas.—There were three sources for natural gas in Tunisia in 2007. They were the offshore Miskar gasfield, which produced 1,640 million cubic meters; the Southgas field (associated with the the Adam, the El Borma, the Franig, the Oued Zar, and the Sabria oilfields), which produced 510 million cubic meters; and gas received as royalty because of the passage of the Trans Mediterranean gas pipeline through Tunisia's land and territorial waters, which totaled 1,160 million cubic meters. The combined output of these resources was, on average, 5.9% less than in 2006 primarily because of the drop in production from the Miskar field (Tunisian National Oil Co., 2008, p. 17).

Petroleum.—Most of the record production of crude oil in 2007 came from five major fields: the Adam concession, which included the Adam, the Dalia, and the Hawa fields; and the Ashtart; the Didon; the El Borma and the Oudna fields. Other oilfields, such as the Cercina and the Franig, were responsible for about 28% of the crude oil produced in the country (Central Bank of Tunisia, 2008, p. 64).

The International Finance Corp. proposed an investment loan of \$18.5 million for TOPIC S.A. of Tunisia, which was an independent exploration and production company, to conduct oil exploration in the Halk El Menzel offshore concession by acquiring geologic data and drilling exploration wells. TOPIC held a 100% interest in the Halk El Menzel offshore concession, which is located offshore Tunisia in the Gulf of Hammamet; a 15% interest in the Jelma property exploration, which is located in the mid-western part of Tunisia; and a 50% interest in the Douleb West prospecting block. The company expected to start producing 7,000 barrels per day (bbl/d) from the Halk El Menzel offshore concession in 2009 (International Finance Corp., 2008, p. 2).

Pioneer Natural Resources Co. (PNRC) of the United States, acquired four onshore permits and two concessions that covered 11,900 km² in the Ghadames Basin located in southern Tunisia; the Adam concession, the Anaguid permit, the Borj El Khadra permit, the Cherouq concession, the El Hamra permit, and the Jenein Nord permit. In addition to being the operator of the field in the Jenein Nord and the Anaguid blocks, the company conducted successful exploration in the Adam and the Borj El Khadra blocks. The output from the Cherouq concession, in which PNRC held a 50% working interest, reached 10,000 bbl/d in 2007 and was expected to reach 15,000 bbl/d by the end of 2008 (Gulf Oil and Gas, 2007; Pioneer Natural Resources Co., 2008, p. 28).

In 2007, Qatar Petroleum International signed a contract with the Tunisian authorities to build a new 140,000-bbl/d-capacity

oil refinery in La Skhira in the Gulf of Gabes. The new refinery was expected to commence operations in 2010. Additionally, the state-owned refining company Société Tunisienne des Industries du Raffinage planned to renovate and expand its refining facility at Bizrete; this facility was the sole refinery in Tunisia (Middle East Economist Digest, 2007).

Outlook

Given that most of the foreign direct investment in Tunisia was in the energy sector and that the share of energy and mineral exports with respect to total exports is increasing, the energy sector and, to a lesser extent, the mineral sector, will remain essential components of Tunisia's economic future. The country's hydrocarbon resources, in particular (despite their small size in comparison with those of neighboring countries), will continue to attract international investors. Moreover, metal deposits in the northwestern part of the country will likely be a subject of interest for further explorations as the demand for steel and cement by local and regional industries increases.

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TABLE 1
 TUNISIA: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2003	2004	2005	2006	2007	
METALS						
Iron and steel:						
Iron ore:						
Direct shipping ore and concentrate, gross weight	164	256	206	214	180	
Fe content ^e	97	134	108	112	94	
Metal:						
Pig iron	36	--	--	--	--	
Steel, crude	86	66 ^r	115 ^r	160 ^r	160	
Lead, mine output, Pb content	metric tons	5,000	5,470	8,708	--	--
Silver, metal, primary ^e	kilograms	3,000	2,400	1,200	--	--
Zinc:						
Concentrate, gross weight	metric tons	65,800	52,747	29,412	--	--
Zn content	do.	36,000	29,011	15,889	--	--
INDUSTRIAL MINERALS						
Barite	metric tons	3,000	1,813	--	--	--
Cement:						
Hydraulic		6,038	6,662	6,691	6,932	7,052
White cement		293	204	333	333	316
Clays, for construction and clay products		4,500	5,200	5,400	5,500 ^r	5,665
Fertilizers:						
Phosphoric acid		1,164	1,241	1,217	1,181	1,140
Diammonium phosphate		1,324	1,314	1,115	1,093	1,008
Triple superphosphate		875	868	848	800 ^r	810
Ammonium nitrate		164	134	149	153 ^r	79
Fluorine, aluminum fluoride		45	42	42	43	46
Gypsum ^{e, 3}		110	108	113	151 ^r	157
Lime		446	476	424	401	395
Phosphate rock, washed, gross weight		7,890	8,051	8,220	7,801	8,005
Salt, marine		700	1,117	1,132	1,127	933
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	2,166	2,298	2,343	2,240 ^r	2,150
Dry	do.	1,763	1,858	1,899	1,720 ^r	1,640
Petroleum:						
Crude	thousand 42-gallon barrels	24,300	25,700	26,200	25,200 ^r	35,100
Refinery products:						
Liquefied petroleum gas	do.	1,200	1,250	1,260	1,280	1,180 ^e
Gasoline	do.	3,600	3,450	1,840	1,540	1,250 ^e
Kerosene	do.	1,270	1,310	1,770	1,050	1,000 ^e
Distillate fuel oil	do.	3,780	3,220	3,600	3,780	4,140 ^e
Residual fuel oil	do.	4,050	3,960	4,060	4,020	4,320 ^e
Other ^e	do.	1,180	660	1,300	1,390	2,270
Total ^e	do.	15,100	13,900	13,800	13,100	14,200

¹Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

²Table includes data available through February 28, 2009.

³In addition to the commodities listed, a variety of crude construction materials (sand and gravel and stone) was produced, but available information is inadequate to make reliable estimates of output.

³Does not include phosphatic gypsum (waste product) generated during fertilizer production.

TABLE 2
TUNISIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ¹
Aluminum fluoride	Industries Chimiques du Fluor	Ghannouch, near Gabes	46
Cement:			
Portland	Société des Ciment d'Enfidha (Corporación Uniland, S.A., 88%)	Enfidha	2,000
Do.	Société des Ciment de Jbel Oust (Cimentos de Portugal SGPS, S.A., 100%)	Jbel Oust	1,600
Do.	Société des Ciment de Gabès (Secil-Companhia Geral de Cal e Cimento, S.A., 99%)	Gabes	1,100
Do.	Société des Ciment d'Oum el Kétil (Government, 100%)	Le Kef	970
Do.	Société des Ciment de Bizerte (Government, 100%)	Bizerte	840
Do.	Société des Ciments Artificiels Tunisiens (Colacem S.p.A., 100%)	Ben Arous	800
White	Société Tuniso-Andalouse de Ciment Blanc S.A. (Grupo Prasa, 100%)	Feriana	333 ²
Fertilizer:			
Ammonium nitrate	Tunisian Chemical Group (GCT) (Government, 100%)	Ghannouch, near Gabes	330 ³
Diammonium phosphate	do.	do.	1,300
Triple superphosphate	do.	M'Dhilla	465
Do.	do.	Sfax	330
Gypsum	Les Plâtres Tunisiens (Knauf Gips KG of Germany)	Maknassy	100
Iron and steel:			
Iron ore	Société de Djebel Djerissa (Government, 100%)	Djerissa Mine	107
Do.	do.	Tamera Mine	73
Steel, crude	Tunisian Steel Manufacturing Co. (El-Fouladh) (Government, 100%)	El Fouladh	100
Steel, rolled, bar and rod	Intermetal S.A. (Private, 100%)	Ben Arous	300
Petroleum, refined	42-gallon barrels per day Société Tunisienne des Industries du Raffinage (Government, 100%)	Bizerte	35,000
Phosphate rock	Gafsa Phosphate Co. (CPG) (Government, 100%)	Kef Eddour Mine	3,200
Do.	do.	Kef Eschfair Mine	3,000
Do.	do.	Jallabia Mining Center	1,700
Do.	do.	Redeyef Mine	150
Phosphoric acid	Tunisian Chemical Group (GCT) (Government, 100%)	Ghannouch, near Gabes	470
Do.	do.	Skhira	375
Do.	do.	M'Dhilla	183
Do.	do.	Sfax	131
Salt	Compagnie Générale des Salines de Tunisie (COTUSAL)	Sfax and Zarzis	800
Do.	SAIDA S.A.	Sebkhet Sidi El Heni	250

Do., do. Ditto.

¹Actual production may significantly exceed nominal capacity.

²Nominal capacity is 260,000 metric tons per year (t/yr)

³Does not include production capacity of 30,000 t/yr of explosives-grade ammonium nitrate.

