

THE MINERAL INDUSTRY OF ALGERIA

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Algeria is located on the southern coast of the Mediterranean Sea between Morocco and Tunisia and shares borders with Libya, Mali, Mauritania, Niger, and Western Sahara. With an area of 2,381,740 square kilometers, Algeria is the second largest country in Africa. Most of the population of this northern African nation, which was estimated to be more than 32 million in 2003, lived in the northern coastal region (U.S. Central Intelligence Agency, 2004¹). The International Monetary Fund (2004²) estimated that the Algerian gross domestic product (GDP) based on purchasing power parity valuation was \$197.2 billion² in 2003; GDP per capita based on purchasing power parity valuation was estimated to be \$6,199. Real GDP was estimated to have increased by 6.7% in 2003 compared with a 4.1% increase in 2002.

Trade

The national economy was dominated by mineral fuels that accounted for about 97% of the value of total Algerian exports. In 2003, exports of hydrocarbons from Algeria were valued at \$23.9 billion compared with \$18.01 billion in 2002. Exports of crude oil and condensate (petroleum liquids at surface pressure and temperature that were recovered as a coproduct of natural gas production) were valued at about \$11.29 billion in 2003 compared with \$8.12 billion in 2002. The 38% increase in crude petroleum revenue was attributed to the 18% increase in the volume of exported crude oil and condensate in 2003 compared with 2002, and an increase in the prices received for crude petroleum, natural gas, and refined petroleum products. As an example of the increase in the price of a barrel of crude oil on the international market, the average free-on-board cost of all crude oil imported into the United States increased to \$25.86 per barrel in 2003 from \$22.63 per barrel in 2002 and \$20.46 per barrel in 2001 (U.S. Energy Information Administration, 2004, p. 123; Ministry of Energy and Mines, 2004a³, p. 5-8; Office Algérien de Promotion du Commerce Extérieur, 2004⁴).

Other Algerian hydrocarbon exports in 2003 included liquefied natural gas (LNG) with a value of \$3.77 billion (compared with \$2.89 billion in 2002); natural gas (by pipeline), about \$3.74 billion (compared with \$2.86 billion in 2002); refined petroleum products, \$3.02 billion (compared with \$2.49 billion in 2002); and liquefied petroleum gas, \$2.16 billion (compared with \$1.76 billion in 2002). Other mineral and mineral-based products exported in 2003 included iron and steel, with a value of \$59.1 million; fertilizers, \$44.9 million; methanol, about \$23 million; copper cathode and copper products, about \$22.9 million; zinc, \$19.6 million; phosphate rock, about \$17 million; aluminum and aluminum products,

\$11.4 million; cement, about \$10 million; and mercury, about \$0.9 million (Ministry of Energy and Mines, 2004a³, p. 5-8; Office Algérien de Promotion du Commerce Extérieur, 2004⁴).

In 2003, 103.7 million barrels (Mbbl) of petroleum products were exported from Algeria to the United States, which placed Algeria third in rank on the list of suppliers. Algeria was the source of 41.3 Mbbl of crude petroleum, which placed the country 15th on the list of nations that supplied crude oil to the United States. Algeria also exported 1.5 billion cubic meters of LNG to the United States in 2003 compared with Canada, which exported about 96.9 billion cubic meters of natural gas to the United States by pipeline; Trinidad and Tobago, which was the source of 10.7 billion cubic meters of LNG; and Nigeria, which exported 1.4 billion cubic meters of LNG to the United States (U.S. Energy Information Administration, 2004b⁵, c⁶).

Structure of the Mineral Industry

Subsidiaries of the Ministry of Energy and Mines were involved in most mineral production. The Ministry's Mining Patrimony National Agency issued mining licenses and titles and the Geology and Mining Control National Agency supervised mining. Nonfuel mineral operations fell under Mining law No. 01-10 of July 3, 2001, and Decree No. 02-65 of June 2, 2002. The National Office of Geological and Mining Research (ORGM) was involved in mineral exploration. The Ministry of Industry oversaw the private and public construction material and mineral product sectors, which included brick, cement, copper, glass, lime, and refined zinc operations. International oil companies primarily operated under contract with the state-owned oil and gas company Société Nationale pour la Recherche, la Production, le Transport, la Transformation, et la Commercialisation des Hydrocarbures s.p.a. (Sonatrach). The national steel and national gold production companies were privatized in 2001 and 2002, respectively. In addition to the National Government-owned companies, numerous private companies and local public enterprises were authorized to produce aggregates, clay, gypsum, marble, or salt. The Ministry of Energy and Mines (2004b⁵) published a directory that listed information about public and private companies in the energy and mining sectors.

Commodity Review

Metals

Gold.—Enterprise d'Exploitation des Mines d'Or S.p.a. (ENOR) mined ore from trenches at Tirek, which was located 400 kilometers (km) southwest of Tamanrasset, and at midyear began mining at Amesmesssa, which was located about 60 km south of the operation at Tirek. At yearend, ENOR's majority equity owner was GMA Resources plc of the United Kingdom, which had acquired Gold Mines of Algeria Pty. Ltd. of Australia in March 2003.

¹References that include a section mark (§) are found in the Internet References Cited section.

²Where necessary, currency values have been converted from Algerian dinars (DA) to U.S. dollars at the average rate of DA80=US\$1.00 for 2003.

The mill at the Tirek pit processed about 7 metric tons per hour (t/hr) of ore until August 2003 when milling was suspended because of mechanical problems. The mill was restarted in December at the rate of 8 t/hr. ENOR began a proposed 269-hole 18,000-meter (m) reverse circulation (RC) program in October and an 83-hole 2,200-m diamond drill exploration program in November. Drillcorp International Ltd. was contracted for the RC program, and ORGM ran the diamond drill program. More than 13,000 m of the RC and 354 m of the diamond drill programs were completed by yearend. In December, ENOR's successful negotiations with the Government resulted in the permission to use explosives to mine ore (Mining Journal, 2003b, c; GMA Resources plc, 2004§).

Iron and Steel.—Ispat Annaba S.p.a. proposed a \$132.5 million program to restore the steel output of the El Hadjar works to 1.75 million metric tons per year (Mt/yr) by yearend 2004. The company had secured a \$25 million loan for the program from the International Finance Corp. Nominal capacity of the blast furnace facility was about 1.8 Mt/yr; one of the plant's two blast furnaces, however, was idle. Rehabilitation of the second blast furnace would include a \$4 million dust extraction system. Ispat Annaba proposed to rebuild the facility's third slab caster, which would have a 600,000-t/yr capacity, and expected to start up the new 400,000-t/yr reinforcing-bar mill in 2004 (International Finance Corp., 2003; Metal Bulletin, 2003).

Mercury.—A severe shipping flask shortage resulted in curtailed mercury production in Algeria (Mining Journal, 2003a).

Industrial Minerals

Cement.—Algerian Cement Co. started cement production in September when the mill at M'Sila began grinding imported cement clinker. Completion of the 2.2-Mt/yr capacity cement kiln was slated for 2004 (ORASCOM Construction Industries, 2003, p. 5).

Sand.—Gold and Industrial Minerals, which was a subsidiary of ORGM, evaluated the feasibility of producing silica sand near Boussaada. Proposed production would be marketed to domestic cement, ceramic, and construction companies.

Mineral Fuels

In February, the Organization of the Petroleum Exporting Countries (OPEC) raised the crude oil production ceiling for Algeria to 782,000 barrels per day (bbl/d) from 735,000 b/d. Algeria's average daily production of 1.2 Mbbbl of crude oil exceeded the OPEC quota in 2003. Condensate (about 445,000 bbl/d) and natural gas liquids production was not subject to the OPEC quotas (Organization of the Petroleum Exporting Countries, 2003; U.S. Energy Information Administration, 2004a§).

International oil and gas companies that had interests in exploration or production contracts with Sonatrach (through local subsidiaries or in joint ventures) included Algerian Libyan Arab Oil Exploration and Production Co. of Algeria, Amerada Hess Corp. of the United States, Anadarko Petroleum Corp. of

the United States, BHP Billiton Plc of the United Kingdom/BHP Billiton Ltd. of Australia, BP p.l.c. of the United Kingdom, Burlington Resources Inc. of the United States, China National Petroleum Corp. of China, Compañía Española de Petroleos, S.A. of Spain, Edison S.p.A. of Italy, ENI S.p.A. of Italy, Exxon Mobil Corp. of the United States, First Calgary Petroleum Ltd. of Canada, Gulf Keystone Petroleum Co. L.L.C. of the United Arab Emirates, Gaz de France Group of France, Itochu Oil Exploration Co. Ltd. of Japan, Japan National Oil Corp of Japan, Kuwait Foreign Petroleum Exploration Co. of Kuwait, Mærsk Olie og Gas A.S. of Denmark, Medex Petroleum North Africa Ltd. of Tunisia, Numhyd a.r.l. of Algeria and Tunisia, Petro-Canada of Canada, Petrofac Resources International Ltd. of the United Kingdom, Petroliam Nasional Bhd. of Malaysia, Repsol YPF, S.A. of Spain, Rosneft-Stroytransgaz Ltd. of Russia, RWE Dea AG of Germany, Talisman Energy Inc. of Canada, Teikoku Oil Co., Ltd. of Japan, Total S.A. of France, Vietnam Oil and Gas Corp. of Vietnam, and Woodside Energy Ltd. of Australia.

The consortium of the BHP Billiton Group (45%), Japan Ohanet Oil and Gas Co. (which comprised Japan National Oil Corp of Japan, Itochu Oil Exploration Co. Ltd. of Japan, and Teikoku Oil Co., Ltd. of Japan) (30%), Woodside Energy (Algeria) Pty. Ltd. (15%), and Petrofac Resources (Ohanet) LLC (10%) began natural gas production from the Ohanet project under a risk service contract with Sonatrach. The \$1 billion development project was designed to process almost 20 million cubic meters per day of wet natural gas and to recover 30,000 bbl/d condensate and about 26,000 bbl/d liquefied petroleum gas (Petrofac Resources International Ltd., 2003). China National Oil and Gas Exploration and Development Corp. (CNODC), which was a subsidiary of China National Petroleum Corp., won a contract to develop oilfields in the Sbaa basin and to build an oil refinery at Adrar with the capacity of about 13,000 bbl/d. Sonatrach estimated that the CNODC project would cost \$350 million (Société Nationale pour la Recherche, la Production, le Transport, la Transformation, et la Commercialisation des Hydrocarbures s.p.a., 2003). Algeria's other oil refineries were operated by the state companies Société Nationale de Raffinage de Pétrole-NAFTEC s.p.a. and Sonatrach.

The U.S. Energy Information Administration (2004a§) reported that as of January 1, 2004, Algeria's estimated natural gas reserves were about 4.5 trillion cubic meters and crude oil reserves were about 11.3 billion barrels.

Outlook

Owing to its location close to Europe (which was the major market for its minerals), its known undeveloped and inferred hydrocarbon deposits, and its infrastructure, Algeria's hydrocarbon sector is expected to continue to be a magnet for foreign direct investment. In a frequently referenced study, Bayphase Ltd. of the United Kingdom estimated that the continued development of the Algerian hydrocarbon sector could absorb \$50 to \$73 billion in domestic and foreign investment between 2003 and 2013, compared with an average of \$2 billion per year that international companies had invested in joint ventures with Sonatrach between 1999 and 2003.

Natural gas production projects under development included In Salah (production expected in 2004), In Amenas (2005), and Gassi Touil (2007) (Oil & Gas Journal, 2003; Medjelled, 2004).

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Major Sources of Information

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TABLE 1
ALGERIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ^{2, 3}	1999	2000	2001	2002	2003 ^p
METALS					
Cadmium, refined ^c	10	10	10	10	10
Gold kilograms	--	--	300	369	365
Iron and steel:					
Iron ore, gross weight thousand tons	1,336	1,645	1,291	1,202	1,378
Metal:					
Pig iron ^c do.	1,000	1,100	1,250	1,300 ^r	1,300
Steel, crude do.	758	842	850 ^c	1,091 ^r	1,051
Lead:					
Concentrate, Pb content	1,215	818	891	1,105	1,108
Metal, refined ^c	5,700	6,100	6,000	6,000	6,100
Mercury kilograms	240,327	215,625	320,091	307,119	17,571
Silver ^c do.	1,400	1,400	1,700	1,700	1,700
Zinc:					
Concentrate, Zn content	9,808	10,452	10,693	8,576	5,201
Metal, smelter output ^c	32,200	34,000	34,000	26,136 ⁴	32,200
INDUSTRIAL MINERALS					
Barite, crude	50,510	51,925	43,020	51,773	45,649
Cement, hydraulic ^{c, 5} thousand tons	7,500	8,300	8,300	9,000	9,000
Clays:					
Bentonite	15,491	22,708	21,286	27,178	25,346
Fuller's earth	2,489	3,431	3,254	3,521	2,573
Kaolin	16,833	11,616	13,356	9,505	16,591
Diatomite	2,563	2,500 ^c	2,863	3,185	2,595
Feldspar	2,820	707	--	--	--
Gypsum ⁶ thousand tons	1,316	1,341	281	322	350
Lime, hydraulic ^c	76,000	96,000	100,000	100,000	100,000
Marble					
Blocks thousand cubic meters	17	25	33	23	24
Crushed stone	67,090	81,907	109,872	108,682	105,249
Slabs thousand square meters	280	250	224	215	180
Nitrogen, N content of ammonia ⁷	455,400	457,900	482,000 ^r	563,100	578,200
Phosphate rock:					
Gross weight thousand tons	1,096	877	939	740	905
P ₂ O ₅ content ^c do.	340	265	280	230	280
Pozzolan ^c	350,000	360,000	362,000	451,000	500,000
Salt, brine and sea salt	163,748	182,000	184,682 ^r	205,321 ^r	191,017
Sand thousand cubic meters	200	200	209	392	495
Sulfur, S content of sulfuric acid ^c	16,300	11,800	7,200	19,300	20,000
MINERAL FUELS AND RELATED MATERIALS					
Coke thousand tons	400 ^c	409	441	450 ^c	450 ^c
Gas, natural:					
Gross million cubic meters	128,783	139,499	140,740	139,998	137,634
Dry ⁸ do.	97,151	100,092	102,332	101,557	98,754
Helium, liquid ^c do.	16 ⁴	10	16 ^r	17	19
Methanol	NA	NA	94,030	91,470	115,690
Natural gas plant liquids thousand 42-gallon barrels	85,411	95,619	99,800	100,850	98,100
Petroleum:					
Crude, including condensate do.	457,158	476,288	464,600	499,890	580,000
Refinery products:					
Liquefied petroleum gas do.	6,191	6,322	6,600	6,870 ^r	7,050
Gasoline do.	20,310	17,964	17,390	16,540	16,150
Naphtha do.	32,757	32,124	34,370	33,690	34,230
Kerosene and jet fuel do.	10,428	12,458	11,510	10,770 ^r	10,170
Distillate fuel oil do.	48,132	44,820	49,790	45,100 ^r	46,150
Lubricants do.	777	770	790	875	980
Residual fuel oil do.	37,842	36,803	42,930	38,850 ^r	41,150
Other do.	2,884	3,044	2,850	2,690	2,120
Total do.	159,321	154,305	166,230	155,385 ^r	158,000

See footnotes at end of table.

TABLE 1--Continued
ALGERIA: PRODUCTION OF MINERAL COMMODITIES¹

²Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^PPreliminary. ^RRevised.
NA Not Available. -- Zero.

¹Table includes data available through July 23, 2004.

²In addition to the commodities listed, secondary aluminum, secondary lead, and secondary copper may be produced in small quantities; crude construction materials for local consumption, and copper, fertilizer, marble slabs, methanol, perlite, urea, and volcanic tuff are produced, but available information is inadequate to make estimates of production levels.

³In addition to the commodities listed, about 700 metric tons per year of caustic soda had been estimated to be produced.

⁴Reported figure.

⁵Erroneous cement units (metric tons instead of thousand tons) were used in previous Algeria production tables published during the period 1997 to 2000.

⁶Includes about 50,000 metric tons per year of plaster.

⁷Additional nitrogen was produced by Helios s.p.a., which is a helium liquids production company. In 1999, the last year for which data are available, Helios produced more than 68,000 42-gallon barrels of liquid nitrogen and 14 million cubic meters of gaseous nitrogen.

⁸Excludes gas used in reinjection, flaring, venting, and transmission losses.