

THE MINERAL INDUSTRY OF MOROCCO AND WESTERN SAHARA

By Bernadette Michalski

Morocco

Morocco is the world's third largest producer of phosphate following the United States and China. The Nation is also a modest producer of antimony, barite, copper, fluor spar, iron ore, lead, manganese, salt, silver, and zinc. The mineral sector is Morocco's largest foreign exchange earning sector and usually accounts for between 2% and 6% of the gross domestic product (GDP). The GDP for 1995 was reported at \$31.3 billion.¹

Current mining legislation in Morocco is based on Mining Code Bill No. 1-73-412 of August 13, 1973. In 1990, the mining law was revised so that the Government was required to respond within 2 months to any foreign investment proposal; and, if not, the contract presumably would be null and void. Generally, any mining law revisions were intended to expedite the bureaucratic process. Regulations concerning the management of petroleum and natural gas resources were revised in June 1991 to provide further incentives for international companies. The revised law reduced the Government's share in agreements with international operators from 50% to 35%. Exploration activity would be fully deductible for more than 10 years for new contracts and more than 3 years for preexisting operators in Morocco. Furthermore, the petroleum tax was waived covering the initial 3 years of production. To complement these new measures, exploration permit sizes were reduced to 2,000 square kilometers (km²) from 5,000 km², and the minimum duration of an agreement was reduced from 15 years to 8 years. In 1992, the Government abrogated the 1974 Moroccanization law, which pertained to petroleum refining and distribution. These latter legal changes were designed to allow foreign companies to participate in the privatization of parastatals in the petroleum sector.

The government has placed 114 diverse enterprises on a privatization list. The enterprises included Société Metallurgique d'Imiter's (SMI) silver mine with capital of \$11.2 million, of which Government owned 69%; and Compagnie de Tifnout Tiranimine (CTT) with a capital value of \$312,000, of which government owned 40%; a fluorite mine of Société Anonyme d'Entreprises Minières (SAMINE) capitalized at \$4 million, of which the Government held a 35% equity share; and a copper mine of Société Minière de Bou-Gaffer (SOMIFER), which was capitalized at \$10.3 million, of which the Government held a 34.2% equity. The

Government also offered 26% of a lead mine of the Société de Fonderies de Plomb de Zalidge with capital of \$2.7 million and, lastly, the 43% of Société Anonyme Cherifienne des Etudes Minières, (SACEM), which exploited the manganese mine of Imini in Ouarzazate. As of mid-1996, little interest for these properties from international mining companies was evidenced, and the Ministry of Privatization announced that negotiations with Moroccan companies would be initiated to meet privatization goals by 1998.

The most pressing environmental issue in Morocco was the pollution of the drinking water supply in the country's two most important river basins, the Sebou basin and Oum Er Rabia basin, from domestic, industrial, and agricultural sources. Silting of dams and the deterioration of other existing water infrastructure were a major concern. Therefore, the World Bank recommended that investments should be made in repairing existing structures as opposed to financing new projects.

Morocco produced a variety of minerals. (See table 1.) However, significant decreases in most metal output levels in 1994 and 1995 were due, in part, to restructuring and consolidation at some mines. Morocco remained a major world producer of phosphate rock and fertilizers, including phosphoric acid, diammonium phosphate, and triple superphosphate. Total fertilizer production for 1995 exceeded 2 million metric tons (Mt).

Morocco is the world's foremost exporter of phosphate and phosphoric acid. Phosphates account for more than 70% of the country's total mineral exports, which also include copper, iron ore, lead, and zinc. Moroccan phosphate exports totaled 9.42 Mt in 1995 with the United States, Spain, and Mexico as the foremost export markets. Copper exports totaled 35,000 metric tons (t), all of which were delivered to Spain and Switzerland. Lead exports totaled 45,200 t, most of which was exported to the European Union and India. Zinc exports totaled 142,000 t, all of which were delivered to the European Union with Spain and France as the principal markets.

The major mineral commodity import continues to be crude oil and petroleum products, which totaled more than 50 million barrels per year valued at approximately \$1 billion. The principal source for imported liquid fuels is Saudi Arabia, followed by Russia and the United Arab Emirates. Other imported mineral commodities include sulfur and solid fuels. Morocco imported about 2.6 Mt of sulfur in 1995 with

Saudi Arabia supplying nearly 1 Mt followed by Canada at 800,000 t and Poland at 600,000 t. Coal and coke imports totaled more than 1.3 Mt. South Africa supplied more than 1 Mt.

The mining industry of Morocco is controlled by the Government, specifically the Directorate of Mines, which is a department of the Ministry of Energy and Mines. The Directorate of Mines is charged with the interpretation and application of the national mining policy. The Directorate also controls the various parastatals and public companies involved in the mining industry. The Directorate of Mines also manages mining properties; labor concerns; commercialization; and studies in mining, mineralogy, and metallurgy. In total, the mining industry employed about 60,000 people in 1995, including 6,800 engineers and technicians. Approximately 12,000 laborers were involved in artisanal mining.

Established in 1928, the Bureau de Recherches et de Participations Minières (BRPM) is an autonomous public corporation involved directly or indirectly in the majority of all Moroccan mining enterprises, excluding hydrocarbons and phosphate. BRPM employed about 1,330 people, including 150 engineers. Founded in 1920, the parastatal Office Cherifien des Phosphates (OCP) manages and controls phosphate mining. OCP controls all aspects of the phosphate industry in Morocco, including research, exploitation, and the production of derivative products, such as fertilizers. In 1995, OCP employed 30,000 people, including 700 engineers and technicians. Created in 1960, La Centrale d'Achat et de Développement de la Région Minière de Tafilalet et de Figuig (CADETAF) promotes the working of artisanal mines of barite, lead, and zinc in the regions of Tafilalet and Figuig. CADETAF provides technical, commercial, and social assistance to the artisanal miners. The Government parastatal that controls hydrocarbon exploration and production is the Office National de Recherches & d'Exploitations Pétrolières.

Omnium Nord Africain (ONA) is the largest private company in Morocco. The company was active in four areas: agricultural distribution, finance, mining, and technology. ONA's mining subsidiary, Pole Mines, was involved in four significant Moroccan mining ventures. Pole Mines' equity ventures included the polymetallic Douar Hajar Mine with Cie. Minière de Guemassa, the Bleida copper mine with Société Minière de Bou-Gaffer (SOMIFER); the world's only primary cobalt mine at Bou Azzer operated by CTT; and the El Hammam fluorite mine operated by SAMINE. All of the latter joint ventures were with BRPM. The only other joint venture in which Pole Mines was not the sole operator is the silver mine at Imiter, operated by SMI with equity ownership by BRPM. Pole Mines also was involved in chemicals, engineering, contracting, mineral exploration, and transport. (See table 2.)

From May 1993 until yearend 1995, the Djebel Aouam Mine remained closed and subject to sale. Belgium's Union

Minière sold its 55.92% stake in Compagnie Royale Asturienne des Mines interests in the Djebel Aouam Mine to Compagnie Foncière du Château d'Eau.

Compagnie Minière de Toussit, operator of the Toussit lead-zinc-silver mine, the largest in Morocco, underwent restructuring.

Privatization of the Moroccan parastatal Société Nationale de Sidérurgie's (SONASID) steel mill in Nador was proposed. In 1995 the mill produced about 420,000 metric tons per year (t/yr) of steel rebar and wire rod for the domestic market. SONASID stated that it must import about 450,000 t/yr of iron and steel billet to meet its requirements. The billet was imported primarily from Europe and Poland. The Government hoped that through privatization the mill would be upgraded with an electric arc furnace and a continuous caster.

Morocco is the world's largest phosphate rock exporter, and it has also developed a significant capacity for conversion of rock into downstream chemicals. Office Cherifien des Phosphates (OCP) reported that its facilities operated at 95% of capacity in 1995. Expansion of the capacity for domestic conversion of rock should result from OCP plans for debottlenecking existing plants. The company estimated that this would produce a 10% to 15% increase in the phosphate chemicals output by yearend 1997.

The Sidi Chennane phosphate rock mine which was operational by yearend 1995, is expected to have a capacity of 5 million metric tons per year (Mt/yr) by 1998 and an eventual capacity of 12 Mt/yr.

Domestic crude oil production was negligible, while the domestic consumption rate was steadily rising. Crude oil and petroleum product import costs approached \$1 billion per year. The refineries at Mohammedia and Sidi Kacem together processed about 49.7 million barrels (Mbbbl) of petroleum products in 1995. Both companies have been slated for privatization.

According to the Ministère de l'Énergie et des Mines, proven reserves of phosphate totaled 85.5 billion tons; coal, 17.5 Mt; copper, 8.4 Mt; lead, 10.7 Mt; and zinc, 8 Mt. Crude oil reserves were reported at 1.2 Mbbbl and natural gas at 1.1 billion cubic meters.

The railroad network in Morocco totaled 1,893 kilometers (km) of 1.435-meter standard-gauge single track. The highway infrastructure totaled 59,198 km, of which 27,740 km was paved. Crude oil pipelines totaled 362 km, and natural gas pipelines totaled 241 km. Morocco's merchant marine fleet comprised 51 ships totaling 487,479 deadweight tons. Of these ships, there were 3 petroleum tankers and 11 chemical tankers. Major Moroccan Ports are at Agadir, Casablanca, Jorf Lasfar, Kenitra, Mohammedia, Nador, Safi, and Tangier. The nation's electrical generation capacity was 2,384 megawatts.

In assessing Morocco's economic performance, the International Monetary Fund (IMF) concluded that the country had made significant strides in restoring its financial

balances. Morocco has been pursuing an active structural adjustment strategy since 1983 under the supervision of the IMF. At that time, the budget deficit stood at 11% of GDP. Under IMF auspices, the budget deficit has been reduced to about 3% of GCP. The privatization program that was begun in 1993, with the intention of transferring resourced from the public sector to the private sector to promote business investment, has met limited success. The public offering of the Société Marocaine de l'Industrie du Raffinage's petroleum refinery was oversubscribed; while international mining interest in silver, copper, and cobalt mines was negligible. The economy should improve markedly with the anticipated entry of Morocco into the planned free trade zone with the European Union, which will award grants and loans to assist the private sector in modernization and expansion activities.

Western Sahara

Predominantly a hot, dry desert country, Western Sahara has a total land area of 266,000 km². The region has been claimed and administered by Morocco since the mid-1970's. In Western Sahara, annual rainfall is negligible, and most foodstuffs must be imported. Economic activity, including all trade, is controlled by the Moroccan Government. Fishing and phosphate mining are the main industries and sources of revenue. The most significant mineral production in the region is from the phosphate mine operated by Office Chérifien des Phosphates at Bou Craa. Production data from Bou Craa were included in total Moroccan phosphate output. Total phosphate rock production from Bou Craa was about 1.5 Mmt/yr in 1995.

¹Where necessary, values have been converted from Moroccan dirhams (DH) to U.S. dollars at a rate of DH8.76=US\$1.00.

Major Sources of Information

Association des Services Géologiques Africains
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Rabat, Morocco

Major Publications

Ministère de l'Energie et des Mines, Direction des
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TABLE I
MOROCCO: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/ METALS	1991	1992	1993	1994	1995 e/
Antimony concentrate:					
Gross weight	374	438	369 r/	523 r/	442 3/
Sb content	168	197	167 r/	235 r/	198 3/
Chromite	500	302 r/	-- r/	-- r/	--
Cobalt concentrate:					
Gross weight	2,953	4,253 r/	3,606	3,810 r/	4,885 3/
Co content	325	467 r/	397	419 r/	537 3/
Copper:					
Concentrates, gross weight	42,202	34,297 r/	35,690 r/	36,010 r/	28,100 3/
Matte, gross weight	2,492 r/	2,177 r/	1,548	1,689 r/	1,993 3/
Cu content, concentrates and matte	15,838	14,317	13,746 r/	14,000 r/	11,467 3/
Gold: e/ kilograms	500	500	600 r/	565 r/ 3/	580
Iron and steel:					
Iron ore:					
Gross weight	98,676	82,625	66,318	63,517 r/	35,536 3/
Fe content	60,192	51,225 r/	41,117 r/	39,380 r/	22,032 3/
Metal: e/					
Pig iron	15,000	15,000	15,000	15,000	15,000
Steel, crude	7,200	7,000	7,000	7,000	7,000
Lead:					
Concentrate:					
Gross weight	102,389	104,940	111,896	104,520 r/	89,700
Pb content	73,720	59,600 r/	81,680	73,160 r/	63,000
Cupreous matte, Pb content	648	566	402	442	500
Metal:					
Smelter, primary only	70,606	68,585	69,110	60,740 r/	50,000
Refined:					
Primary	70,500 r/	68,500 r/	69,100 r/	60,700 r/	50,000
Secondary e/	2,000	2,000	2,000	2,000	2,000
Total e/	72,500 r/	70,500 r/	71,100 r/	62,700 r/	52,000
Manganese ore, largely chemical-grade	59,255	49,120 r/	42,600	31,452	23,510 3/
Mercury, byproduct e/ kilograms	20,000	20,000	20,000	20,000	20,000
Silver:					
Ag content of concentrates and matte do.	91,115	69,386	73,355	68,500	50,000
Ag content of mine and smelter bullion do.	204,960	143,900	235,800	257,000	204,400
Total do.	296,075	213,286	309,155	325,500	254,400
Zinc concentrate:					
Gross weight	47,709	42,649 r/	125,737	147,213	148,800 3/
Zn content	24,800 r/ e/	22,603	65,378	77,000 e/	77,300
INDUSTRIAL MINERALS					
Barite	433,325	401,599 r/	325,200	264,526 r/	163,376 3/
Cement, hydraulic thousand tons	5,770	6,340	6,350 r/ e/	6,350 r/ e/	6,350
Clays, crude:					
Bentonite	11,055 r/	7,273 r/	10,802 r/	24,919 r/	29,308
Fuller's earth (smectite)	37,552	38,098 r/	38,700	22,800	20,000
Montmorillonite (ghassoul)	3,900	2,670	2,440	3,329	3,350
Feldspar e/	1,000	1,000	1,000	1,000	1,000
Fluorspar, acid-grade	74,600	85,500	70,050 r/	85,000	105,000 3/
Gypsum e/	450,000	450,000	450,000	450,000	450,000
Mica e/	1,500	1,500	1,500	1,500	1,500
Phosphate rock (includes Western Sahara) thousand tons	17,970 r/	19,146	18,305	20,375	20,400
P2O5 content do.	5,700	6,180	5,920	6,580	6,580
Salt:					
Rock	108,806	164,528	103,525 r/	142,258 r/	137,910 3/
Marine	--	--	50,900	45,600	42,300 3/

See footnotes at end of table.

TABLE 1--Continued
MOROCCO: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995 e/
MINERAL FUELS AND RELATED MATERIALS					
Coal, anthracite	552,250 r/	575,900	603,800	650,400	649,600 3/
Gas, natural:					
Gross	38	20 r/	38 r/	25 r/	17
Dry	35 r/	18 r/	35 r/	22 r/	16
					million cubic meters
Petroleum:					
Crude	83	67	68 r/	70 r/	70
					thousand 42-gallon barrels
Refinery products: 4/					
Liquefied petroleum gas	do.	2,770	2,920	3,250	3,300
Gasoline	do.	2,331	3,460 r/	3,285 r/	3,300 r/
Jet fuel	do.	1,461 r/	1,600 r/	2,190 r/	1,900 r/
Kerosene	do.	341	351	350	390
Distillate fuel oil	do.	13,650 r/	15,475 r/	14,435 r/	16,200 r/
Residual fuel oil	do.	14,016	14,965	17,150	17,200
Other	do.	6,200 r/	7,665 r/	6,500 r/	7,000 r/
Total	do.	40,769 r/	46,436 r/	47,160 r/	49,290 r/

e/ Estimated. r/ Revised.

1/ Includes data available through June 1, 1996.

2/ In addition to the commodities listed, a variety of crude construction materials is produced including possibly a substantial amount of limestone; however, information is inadequate to make reliable estimates of output levels.

3/ Reported figure.

4/ Refinery fuel and loss has been included in the output of individual products and is estimated to be about 1.8 million barrels per year.

TABLE 2
MOROCCO: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Metric tons unless otherwise specified)

Major commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Anthracite	Charbonnages du Maroc (CdM) (98.89% BRPM)	Jerada	650,000.	
Barite	Compagnie Marocaine des Barytes (COMABAR) (22.5% BRPM, 55% Transocean Drilling)	Zelmou	270,000 concentrate.	
Cobalt	Compagnie Tifnout Tiranimine (CTT) (40% BRPM, 55.2% ONA)	Bou Azzer	150,000 ore. 50,000 concentrate.	
Copper	Société Minière de Bou Gaffer (SOMIFER) (34.2% BRPM, 7.6% ONA)	Bleida	50,000 concentrate.	
Do.	Société de Développement du Cuivre de l'Anti-Atlas (SODECAT) (100% BRPM)	Tiouit	4,500 Cu/Au/Ag concentrate.	
Fluorspar	Société Anonyme de Entreprises Minières (SAMINE) (35% BRPM, 17.7% ONA)	El Hammam	110,000 concentrate.	
Lead	Compagnie Minière de Guemassa (CMG) (74% ONA, 26% BRPM)	Hajar	150,000 Zn concentrate. 32,000 Pb concentrate. 14,000 Cu concentrate.	
Do.	Compagnie Minière de Touissit (CMT) (50% Compagnie Royale Asturienne des Mines S.A., Belgium)	Touissit	73,000 concentrate.	
Do.	Société de Développement Industriel et Minière (50% BRPM)	Zeida	40,000 concentrate.	
Manganese	Société Anonyme Chérifienne d'Etudes Minières (SACEM) (43% BRPM, 30% COMILOG)	Imini	130,000 concentrate.	
Petroleum refinery products	thousand 42 gallon barrels	Société Marocaine de l'Industrie du Raffinage (68.8% Government, 30% public offering)	Mohammedia	45,000
Do.	Société Chérifienne des Pétroles (SCP) (79.5% Government, Elf Aquitaine 24.5%)	Sidi Kacem	9,000	
Phosphate	million metric tons	Office Chérifien des Phosphates (OCP) (Government, 100%)	Khouribga, Youssoufia, Menguerir, and Bou Craa.	25 concentrate.
Salt	Société de Sel de Mohammedia (SSM) (100% BRPM)	Mohammedia	150,000.	
Do.	Société Chérifienne des Sels (SCS) (50% BRPM, 50% SNSSS)	Zima	50,000.	
Silver	Société Metallurgique D'Imiter (SMI) (69% BRPM, 31% ONA)	Near Quarzazate	73,000 ore.	