

# MOROCCO AND WESTERN SAHARA

By Philip A. Szczesniak

Morocco's oil and gas industry announced in 2000 a "major" discovery in northeastern Morocco, but then the original estimates were lowered after further analysis. The prospects for other finds, however, drew international interest. Government officials noted that despite the oil discovery, in the near future the economy would continue to be highly dependent on imported oil which continued to negatively affect the economy. In 1999, Morocco's gross domestic product based on purchasing power parity was estimated at \$108 billion and exports were \$7.4 billion led by agricultural products; the leading mineral export was phosphate rock at \$434 million. As of July 2000, the estimated population for Morocco and Western Sahara was more than 30 million (U.S. Central Intelligence Agency, 2000, Morocco—Economy, World Factbook 2000, accessed August 16, 2001, at URL <http://www.odci.gov/cia/publications/factbook/geos/mo.html>; U.S. Central Intelligence Agency, 2000, Western Sahara—Economy, World Factbook 2000, accessed August 16, 2001, at URL <http://www.odci.gov/cia/publications/factbook/geos/wi>; World Bank, August 28, 2000, Morocco at a glance, accessed September 18, 2001, via URL <http://www.worldbank.org/data/countrydata/countrydata.html>). Morocco and Western Sahara were the world's third largest producer of phosphate rock after the United States and China in 2000 (Jasinski, 2001). Morocco also mined a wide range of minerals that included antimony, barite, coal, cobalt, copper, fluorspar, gold, iron ore, lead, manganese, salt, silver, and zinc and had a significant capacity for conversion of phosphate rock into fertilizer. The mineral industry was Morocco's largest foreign-exchange-earning sector.

The Government agency responsible for overseeing the mining industry of Morocco is the Ministry of Industry, Trade, Energy, and Mines. Several state-owned organizations play a direct role in mineral resource development. The Bureau de Recherches et de Participations Minières (BRPM) is responsible for the development of most mineral resources. La Centrale d'Achat et de Development de la Region Minière de Tafilalet et de Figuig was formed to promote and support the interests of artisanal miners in the Tafilalet and Figuig regions. The Office Cherifien des Phosphates (OCP) is responsible for managing and controlling all aspects of phosphate mining and beneficiation (Mbendi, April 24, 2001, Morocco—Mining—Overview, accessed September, 19, 2001, at URL <http://www.mbendi.co.za/indy/ming/af/mo/p0005.htm>).

The Office National de Recherches et d'Exploitations Pétrolières (ONAREP) is responsible for overseeing the energy sector (Mbendi, July 12, 2001, Morocco—Oil and gas industry, accessed September, 25, 2001, at URL <http://www.mbendi.co.za/indy/oilg/af/mo/p0005.htm>). During 2000, ONAREP made changes to petroleum laws to encourage more investment. More specifically, new petroleum laws

included a 10-year tax holiday after first production for offshore operators and a reduction in royalty payments to 10% for onshore and shallow water producers and to 7% for deepwater producers (World Oil, 2000).

Holding Minier du Groupe ONA (Managem) of Morocco announced that it would develop the gold deposit at Akka. In September 2000, Managem signed an agreement with La Société de promotion et de participation pour la coopération économique (Proparco) (a subsidiary of Agence Française de Développement) for a \$20 million loan that will help fund the project (Africa Energy & Mining, 2000a). Managem and BRPM estimated that the deposit's reserves were 30 metric tons (t) of gold (Middle East Economic Digest, 1999).

In July, Icelandic Gold Corp. announced that owing to unsuccessful attempts at funding, it was relinquishing its option on the Zkounder silver project, which is located 770 kilometers (km) south of Rabat (Yahoo!News, July 11, 2000, Icelandic Gold withdraws from Zkounder, accessed July 12, 2000, at URL <http://biz.yahoo.com/em/000711/j.html>). In September 2000, BRPM launched a preselection tender for the Zkounder silver deposit. The deposit covers an area of 5 km and has estimated resources of 300,000 t that grades between 300 and 800 grams per metric ton silver concentrate (Actualités Presse, September 25, 2000, Morocco launches tender for Zkounder silver mine, accessed May 15, 2001, at URL <http://www.aim.net.ma/Sept258.htm>).

In September 2000, the Société Nationale de Sidérurgie launched the construction of a new industrial plant that is expected to produce concrete steel-reinforcement bars and hot-rolled metal sections. The 300,000-metric-ton-per-year-(t/yr)-capacity rolling mill, which covers an area of 25 hectares inside the Jorf Lasfar industrial area, was expected to start production in 2002 at a cost of \$60 million (Metal Bulletin, 2000; Mincom Ilaycom weekly news, September 2000, King Mohammed VI launches construction materials unit plant, accessed September 24, 2001, at URL <http://www.mincom.gov.ma/news/2000/2509to3009/roy/roy.htm>).

In the cement sector, the leading companies that operated in Morocco in 2000 were Lafarge Ciments of France, Ciments du Maroc (controlled by Italcementi of Italy), Ciments de l'Oriental (CIOR) (controlled by Holderbank of Switzerland), and Asmet de Temara (controlled by Cimentos de Portugal SGPS, SA). In 2000, Managem and Lafarge Ciments announced a joint venture to build a 960,000-t/yr-capacity cement plant in the northern Moroccan city of Tetuan. The plant would cost \$120 million and was anticipated to begin operating by 2003. They also noted that the plant would help meet Moroccan cement needs, which they estimated would grow from 7 million to 15 million metric tons by 2015 (Arabicnews.com, January 15, 2000, Moroccan and French firms to invest \$120 million in cement plant, accessed

September 25, 2001, at URL <http://www.arabicnews.com/ansub/Daily/Day/000115/2000011526.html>).

In late 1999, CIOR announced that it had completed feasibility studies and decided to build a 1-million-metric-ton-per-year-capacity cement plant in the Settat area, which is 140 km south of Rabat. CIOR noted that the plant, Atlacim, would require an investment of \$102 million and would begin operating in 2001 (Arabic News.com, August 26, 1999, Cement firm Cior to build \$102 million cement plant, accessed September 25, 2001, at URL <http://www.arabicnews.com/ansub/Daily/Day/990826/1999082652.html>).

In December 2000, OCP officials commented on the impact of oil and gas discoveries on the phosphate mining industry. They noted that they were very interested in the developments because the sulfur and ammonia needed for phosphate fertilizer were processed from gas. If gas reserves prove to be significant, then plans would be made to construct plants to manufacture sulfur and ammonia (Arabic News.com, December 5, 2000, OCP interested by hydrocarbon finds in Morocco, general manager says, accessed September 25, 2001, at URL <http://www.arabicnews.com/ansub/Daily/Day/001205/2000120529.html>). Production of phosphate rock declined slightly to 21,459,000 t in 2000 from 22,163,000 t in 1999.

In August 2000, Lone Star Energy Corp. (a subsidiary of Skidmore Energy Inc. of the United States) announced that it had discovered oil and gas in Talsinnt, a northeastern region in the High Atlas Mountains of Morocco 200 km from the Algerian border. Early estimates put reserves at more than 10 billion barrels of oil and 200 billion cubic meters of gas; those estimates, however, were later revised downward to more conservative estimates of 50 million to 100 million barrels. Lone Star Energy Corp. was expected to drill an additional 100 wells in Talsinnt, which would increase its initial investment of \$30 million to \$150 million; the field was expected to come on-stream within 3 years. Government officials estimated that the overall investment in developing the Talsinnt region would likely increase from \$160 million to more than \$1 billion (Africa Energy & Mining, 2000b; Financial Times, 2000; Middle East Economic Digest, 2000).

In 2000, petroleum exploration or prospecting licenses in force were held by the state-owned ONAREP or by joint ventures of ONAREP and international companies, which included Conoco (U.K.) Ltd., Energy Africa Ltd. of South Africa, Enterprise Oil Exploration Ltd. of the United Kingdom, Kappa Energy Co. Ltd. of Canada (formerly Cabre Exploration Ltd.), Kerr-McGee Corp. of the United States, Lasmo Overseas Nederland (II) B.V., Shell Prospecting Africa B.V., Skidmore Energy Inc. of the United States, Taurus Petroleum AB of Sweden, and Vanco Energy Co. of the United States (Arab Petroleum Research Center, 2001, p. 283).

Besides the Talsinnt region, exploration was ongoing in seven other regions—the Loukos South Offshore block in the Atlantic Ocean north of Rabat; the Al Hoceima-Nador Offshore area in the Mediterranean; the Cap Draa Haute Mer Offshore area south of Agadir; an offshore block south of Rabat; a block at Labrouj in the center of the country; an area around Ounoura, on the Atlantic coast near Essaouira; and five deepwater blocks on the Atlantic coast south of Agadir (U.S. Energy Information Administration, January 2001, Morocco—Oil and gas, accessed September 26, 2001, at URL <http://www.eia.doe.gov/emeu/>

[cabs/morocco.html](http://www.eia.doe.gov/emeu/cabs/morocco.html)).

Morocco's major oil distributor is the Société Anonyme Marocaine de l'Industrie Raffinage (SAMIR). In 2000, SAMIR was engaged in an investment project of \$400 million to upgrade its refining capabilities. When the upgrade is complete, SAMIR will have a capacity of 140,000 barrels per day (Washington Times, November 27, 2000, Oil served on a silver platter, accessed March 27, 2001, at URL <http://www.internationalreports.com/africa/00/morocco/12.html>).

In February 2001, CMS Energy Corp. of the United States announced that commercial operation had been achieved at Unit 4 of its \$1.5 billion 1,356-megawatt Jorf Lasfar powerplant, which is located on the Atlantic coast of Morocco 126 km southwest of Casablanca. The Jorf Lasfar facility will generate more than one-half of Morocco's total electricity supply using coal and is considered to be the largest independent powerplant in Africa. CMS Energy has been supplying power to the Office Nationale de l'Electricité (the Moroccan national utility) (CMS Energy Corp., February 9, 2001, CMS Energy announces commercial operation of Unit 4 at Jorf Lasfar powerplant in Morocco, accessed September 26, 2001, at URL <http://www.consumersenergy.com/apps/NewsArticleCMS.asp?ID=817>).

In January 2001, the Office National des Chemins de Fer du Maroc announced plans to spend \$162 million in 2001 on upgrading the country's railway network. Specifically, an extra track will be laid between Meknes and Fez, and port stations at Ain Sbaa and Casablanca will be refurbished. The project, which was launched in 2000, is part of a 4-year \$650 million plan primarily to deal with handling increased ridership by tourists and the needs of the phosphate industry. The project was being financed by the European Investment Bank and the Japanese Bank for International Cooperation (Actualités Presse, January 26, 2001, Morocco plans to spend \$162 mln in 2001 on upgrading railway, accessed May 15, 2001, at URL <http://www.aim.net.ma/Jan26201.htm>).

## References Cited

- Africa Energy & Mining, 2000a, Morocco—New mine at Akka: Africa Energy & Mining, September 13, no. 282, p. 6.  
———2000b, Talsinnt—Realism after euphoria: Africa Energy & Mining, August 30, no. 281, p. 1.  
Arab Petroleum Research Center, 2001, Morocco, in Arab oil & gas directory: Paris, France, Arab Petroleum Research Center, p. 279-294.  
Financial Times, 2000, Oil and gas finds raise Moroccan hopes: Financial Times [London, United Kingdom], August 25, p. 6.  
Jasinski, S.M., 2001, Phosphate rock: U.S. Geological Survey Mineral Commodity Summaries 2001, p. 120-121.  
Metal Bulletin, 2000, Moroccan works plans new bar and section mill: Metal Bulletin, no. 8456, March 6, p. 19.  
Middle East Economic Digest, 1999, Morocco—ONA invests in gold mine: Middle East Economic Digest, v. 43, no. 22, June 4, p. 22.  
———2000, Morocco claims major find: Middle East Economic Digest, v. 44, no. 35, September 1, p. 10.  
World Oil, 2000, Others—Morocco: World Oil, v. 221, no. 8, August, p. 90.

## Major Sources of Information

Ministry of Industry, Trade, Energy, and Mines  
Rabat-Institute Haut Agdal  
B.P. 6208  
Rabat, Morocco

Direction des Mines  
Rabat-Institute Haut Agdal  
B.P. 6208  
Rabat, Morocco  
Telephone: (212) (7) 77-28-46  
Fax: (212) (7) 77-79-42

Direction de la Geologie  
Rabat-Institute Haut Agdal  
B.P. 6208  
Rabat, Morocco  
Telephone: (212) (7) 77-28-24  
Fax: (212) (7) 77-79-43

TABLE 1  
MOROCCO AND WESTERN SAHARA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1996	1997	1998	1999	2000
<b>METALS</b>					
Antimony concentrate:					
Gross weight	345	350 e/	350 e/	350 r/	350 e/
Sb content	152 e/	160	160 e/	150 r/	150 e/
Cobalt concentrate:					
Gross weight	5,033	7,137	2,874	9,488	14,341
Co content	565	714	287	863	1,305
Cobalt recovered from tailings	80	220 e/	242	472	1,200
Copper:					
Concentrates, gross weight	37,623	37,344	26,780	25,260	23,150
Matte, gross weight	1,671	2,682	2,841	2,212	2,117
Cu content, concentrates and matte	14,550	15,400	8,200	7,747 r/	7,125
Gold e/ kilograms	482 4/	450	450	-- r/	334
Iron and steel:					
Iron ore:					
Gross weight	11,842	11,965	9,285	6,625	5,612
Fe content	8,257	8,260 e/	6,220	4,440 e/	3,760 e/
Metal: e/					
Pig iron	15,000	15,000	15,000	15,000	15,000
Steel, crude	5,000	5,000	5,000	5,000	5,000
Lead:					
Concentrate:					
Gross weight	107,577	110,507	115,042	114,184	117,510
Pb content	71,667	77,056	79,300	79,900 r/	82,300
Cupreous matte, Pb content e/	500	500	600	600	600
Metal:					
Smelter, primary only	61,749	66,202	65,000 e/	65,209 r/	66,812
Refined:					
Primary	62,700 e/	64,202	60,929	65,209	66,812
Secondary e/	3,100 4/	3,000	3,000	3,000	3,000
Total	65,800	67,202	63,929	68,200	69,812
Manganese ore, largely chemical-grade	29,466	30,806	28,332	29,150	25,830
Mercury e/	--	5	10	10	10
Silver:					
Ag content of concentrates and matte kilograms	19,304	35,000	66,531	51,197	43,000
Ag content of mine and smelter bullion do.	180,291	226,000	240,412	226,692	246,000
Total do.	199,595	261,000	306,943	277,889	289,000
Zinc concentrate:					
Gross weight	152,580	171,796	216,011	216,197	201,741
Zn content	79,662	89,248	112,000	111,703	105,107
<b>INDUSTRIAL MINERALS</b>					
Barite	282,537	338,096	353,438	328,945	320,243
Cement, hydraulic thousand tons	6,585	7,236	7,200 e/	7,200 e/	7,200 e/
Clays, crude:					
Bentonite	39,680	49,633	33,311	36,528	21,352
Fuller's earth (smectite)	17,223	24,425	27,650	21,956	30,665
Montmorillonite (ghassoul)	3,169	2,933	3,180	2,750	2,476
Feldspar	12,659	15,110	18,332	1,112	8,400
Fertilizers thousand tons	2,200 e/	2,200 e/	2,132	2,111	2,100 e/
Fluorspar, acid-grade	95,900	103,800	105,000	83,100	77,800
Gypsum e/	450,000	450,000	450,000	450,000	450,000
Mica e/	600	600	600	210 4/	1,897 4/
Phosphate rock (includes Western Sahara):					
Gross weight thousand tons	20,855	23,084	23,587	22,163 r/	21,459
P <sub>2</sub> O <sub>5</sub> content do.	6,552	7,848	7,850	7,500	7,200
Phosphoric acid do.	2,583	2,600 e/	2,669	2,696	2,731
Salt:					
Rock	138,290	210,000 e/	107,604	156,158 r/	147,960
Marine e/	32,530 4/	47,500	40,000	40,000	40,000
Talc and pyrophyllite	13,053	19,850	12,000 r/ e/	12,522 r/	14,655

See footnotes at end of table.

TABLE 1--Continued  
MOROCCO AND WESTERN SAHARA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1996	1997	1998	1999	2000
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal, anthracite	505,600	376,300	269,100	129,200	28,725
Gas, natural:					
Gross million cubic meters	22	38	43	44	44 e/
Dry e/ do.	20 4/	35	38	39	39
Petroleum:					
Crude thousand 42-gallon barrels	35	35	35	35	35 e/
Refinery products: 5/					
Liquefied petroleum gas do.	2,000	2,489	2,617	3,129	2,800
Gasoline do.	3,000	3,428	3,548	3,842	3,833
Jet fuel do.	2,000	1,982	2,544	2,213	2,230
Kerosene do.	300	481	611	750	802
Distillate fuel oil do.	14,000	17,800	16,667	18,716	18,000 e/
Residual fuel oil do.	10,000	11,394	12,766	16,706	16,000 e/
Other do.	5,000	6,000	8,517	5,296	5,000 e/
Total do.	36,300	43,574	47,270	50,652	48,665 e/

e/ Estimated. r/ Revised. -- Zero.

1/ Includes data available through September 26, 2001.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

3/ In addition to the commodities listed, arsenic trioxide and a variety of crude construction materials are produced; but information is inadequate to make estimates of output levels.

4/ Reported figure.

5/ Refinery fuel and losses have been included in the output of individual products and is estimated to be about 1.8 million barrels per year.

TABLE 2  
MOROCCO AND WESTERN SAHARA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Anthracite coal	Charbonnages du Maroc [Bureau de Recherches et de Participations Minières (BRPM), 98.89%]	Jerada	650,000.
Barite	Compagnie Marocaine des Barytes (COMABAR) (BRPM, 22.5%; Norbar Minerals AS, 55%)	Zelmou	150,000.
Do.	do.	Safi	80,000.
Do.	Société Nord Africaine de Recherches et d'Exploitation des Mines d'Argana	Argana	30,000 chemical grade.
Do.	do.	do.	120,000.
Bentonite	Tolsa, SpA (Tolsa, 100%)	Iboughardain	20,000.
Do.	Société d'Exploitation des Mines du Rif (BRPM, 100%)	Ouziane- Bouhoua	15,000.
Do.	Compagnie Marocaine des Barytes (BRPM, 22.5%; Norbar Minerals AS, 55%)	Azzouzet-Tidiennit	36,000.
Cement	Asment de Temara (Cimentos de Portugal, 57.4%)	Temara	830,000.
Do.	Lafarge Ciments (Société Nationale d'Investissement, 50%)	Casablanca	2,000,000.
Do.	do.	Meknes	850,000.
Do.	do.	Tamuda	800,000.
Do.	do.	Tangier	350,000.
Do.	Cimenterie de l'Oriental (Holderbank, 51%; private, 35%)	Oujda	1,000,000.
Do.	do.	Ras El Ma	1,200,000.
Do.	Ciments du Maroc (Ciments Fraçais, 55.5%)	Agadir	1,100,000.
Do.	do.	Marrakech	1,300,000.
Do.	do.	Safi	650,000.
Cobalt	Compagnie de Tifnout Tiranimine (CTT) [Omnium Nord Africain (ONA), 55.2%; Société Metallurgique d'Imiter (SMI), 20%]	Bou Azzer	150,000 ore, 50,000 concentrate.
Copper	Société Minière de Bou Gaffer (BRPM, 34.2%; SMI, 36%; ONA, 7.6%)	Bleida	50,000 concentrate.
Do.	Société de Développement du Cuivre de l'Anti-Atlas (BRPM, 100%)	Tiouit	4,500 Cu, Au, Ag concentrate.
Fluorspar	Société Anonyme d'Entreprises Minières (ONA, 58%; SMI, 42%)	Meknes	120,000 concentrate.
Gold	Akka Gold Mining Company (ONA, 70%; BRPM, 30%)	Iourim	NA.
Iron ore million metric tons	Société d'Exploitation des Mines du Rif (SEFERIF) (BRPM, 100%)	Nador	12.
Lead	Compagnie Minière de Guemassa (CMG) (ONA, 74%; BRPM, 26%)	Hajar	150,000 Zn concentrate, 32,000 Pb concentrate.
Do.	Compagnie Minière de Touissit (CMT) (Compagnie Royale Asturienne des Mines S.A., Belgium, 50%)	Touissit	73,000 concentrate.
Do.	Société de Développement Industriel et Minière (BRPM, 50%)	Zeida	40,000 concentrate.
Manganese	Société Anonyme Chérifienne d'Etudes Minières (BRPM, 43%; Compagnie Minière de l'Ogooué SA, 30%)	Quarzazate	130,000 concentrate.
Petroleum refinery products thousand 42-gallon barrels	Société Marocaine de l'Industrie du Raffinage (Corral Morocco Saudi Co., 100%)	Mohammedia	47,000.
Do.	do.	Sidi Kacem	9,500.
Phosphate million metric tons	Office Chérifien des Phosphates (Government, 100%)	Youssoufia	6 concentrate.
Do.	do.	Benguerir	6 concentrate.
Do.	do.	Khouribga	4 concentrate.
Do.	do.	Sidi Chenan	5 concentrate.
Do.	do.	BouCraa	6 concentrate.
Salt, rock	Société de Sel de Mohammedia (BRPM, 100%)	Mohammedia	150,000.
Salt, marine	Société Chérifienne des Sels [BRPM, 50%; Société Nouvelle des Salins du Sine Saloum, 50%]	Zima	50,000.
Silver kilograms	Société Metallurgique d'Imiter (SMI) (ONA, 67%; private, 20%; BRPM, 13%)	Near Quarzazate	210,000.
Steel rebar, wire rod	Société Nationale de Sidérurgie (private, 65%)	Nador	480,000.
Zinc	Omnium Nord Africain mine and plant (ONA, 100%)	Guemassa	265,000 concentrate.
Zircon	Agrupacion Minera de Investigaciones SA	Guelmin	NA.

NA Not available.