

THE MINERAL INDUSTRY OF

LIBYA

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Lacking substantial industrial diversification, nearly 95% of Libya's revenues were attributed to the hydrocarbon sector. Libya's petroleum reserves were the largest on the African Continent but remained underexploited. However, Libya was the second largest crude oil producer in Africa, following Nigeria. With the exception of the Misurata Steel Works, the nation's nonfuel mineral industry sector offered little significance. Nonfuel mineral output was confined to the extraction of salt from the coastal plains near Benghazi and Tripoli and the quarrying of gypsum, limestone and clay near Al Khums. The Iron and steel complex appears to be operating at only about two-thirds of its design capacity of 1.2 million metric tons per year (Mt/yr).

As of yearend 1995, the Libyan Government had not complied with the United Nations Security Council request to extradite Libyan suspects in the Lockerbie, Scotland, airline bombing to either the United Kingdom or the United States. As a result, the economic sanctions against the Government of Libya were renewed. The United Nations resolutions called for the banning of sales to Libya of equipment used at oil and natural gas export terminals and refineries and the freezing of Libyan funds, with the exception of revenue derived from oil and gas sales. These resolutions against Libya originally promulgated in 1993 by the United Nations Security Council fell short of a comprehensive oil embargo. European nations, such as Germany, Italy, and Spain, did not support a total oil embargo owing to their continuing heavy dependence on Libyan crude oil.

The Libyan legal system was based on Italian civil law and Islamic law. The nation possessed a predominantly state-run, socialist economy, and the mineral industry was no exception. The Libyan National Oil Corp. (NOC), created by the Government in 1970 to oversee petroleum and natural gas exploration, production, and marketing, maintained complete control of Libyan oilfields and related investments, including marketing all the petroleum that is produced.

Petroleum exploration and production sharing, along with any proposed mining activities, were based on the Fiscal Provisions, Revenue and Financial Law of July 1, 1977. A 1981 amendment defined production-sharing terms based on the following criteria: 85% to 15% in the Government's favor for highly significant hydrocarbon prospects, 81% to 19% for moderately significant oil prospects, and 75% to 25% for the least promising areas. An amendment followed in 1988 with

revised terms that called for exploration costs to be recovered from output, with development costs to be equally split between the foreign operator and the NOC. The terms also called for production output to be shared between the contractor and NOC on a sliding scale and for tax and royalty exemption for the contractor.

Apart from hydrocarbons, mineral production in Libya was negligible. Mining activity included quarrying of clays, gypsum, and limestone; and cement and ammonia production. Iron and steel production remained well below design capacity. Heavily subsidized by the Government, iron and steel production relied upon imported feed materials. (See table 1.)

Hydrocarbons accounted for approximately 95% of total Libyan exports. The Government reported that in 1995, the total value of Libyan exports was \$9.3 billion¹ and the total value of imports was \$7.3 billion. Libya exported more than 1.2 million barrels per day of petroleum to Europe and about 1.5 million cubic meters (Mm³) of liquefied natural gas in 1995 with Spain's Enagas as the sole market.

The Libyan Iron and Steel Co. (LISCO) plant at Misurata, includes two 550,000-metric-ton-per-year (t/yr) Midrex direct reduction modules, six electric furnaces with a combined annual capacity of 1.25 Mt/yr, and a 140,000-t/yr cold-rolling mill. Although the plant has been operating below capacity, construction on a third DR module of 650,000 t/yr capacity began in 1995 with commissioning scheduled for 1998.

Italy's Azienda Generali Italiana Petroli S.p.A. (AGIP) remained the largest petroleum producer in Libya by virtue of its 310,000 barrels per day (bbl/d) combined production from the Bu Attifel (170,000 bbl/d) and Bouri (140,000 bbl/d) Fields. Other significant foreign operators included France's Société National Elf Aquitaine and Germany's Veba AG and Wintershall AG. Libya continued to rely on foreign expertise and technical personnel to develop its petroleum industry. A consortium of European companies composed of Repsol of Spain, TOTAL of France, and OMV of Austria signed a \$1 billion contract to develop the Murzuk Field in southwest Libya. Expected to produce eventually 250,000 bbl/d, the field contains an estimated reserve of 800 million to 1 billion barrels of 43° API low-sulfur crude. It is scheduled to enter initial production by December 1996 at 50,000 bbl/d.

Libya's total domestic refining capacity was 342,000

bbbl/d. Libya also has developed extensive refining and distribution operations in its main European export markets—Italy, Germany, and Switzerland. Distribution networks were established also in Spain and Hungary with possible inroads to eastern European countries. Libya's three refineries in Europe have a combined capacity of 300,000 bbl/d bringing total refinery capacity at home and abroad to 642,000 bbl/d.

Libya possessed the largest crude oil reserves in Africa, estimated by the NOC 45.5 billion barrels assuming a recovery rate of 35% of 130 billion barrels in place. Total natural gas reserves in Libya were estimated by the NOC at 1.3 trillion cubic meters ranking third on the continent after Algeria and Nigeria. While Libya hosts other mineral resources, including gypsum, magnetite, phosphate rock, potash, sodium chloride, and sulfur, no figures for these reserves have been officially reported.

Highways within Libya totaled 32,500 kilometers (km), of which 24,000 km were paved. Transportation of petroleum and natural gas was primarily through a network of pipelines from wellhead to processing and shipping points that were primarily on the Mediterranean coast. Crude oil pipelines totaled 4,383 km, and natural gas pipelines totaled 1,947 km. Petroleum products traversed 443 km of pipeline. Libyan oil exports were conducted through six main terminals at Es-Sider, Marsa el-Brega, Tobruk, Ras Lanuf, Zawia, and Zueitina. Libya's General National Maritime Transport Co. operated a fleet of 25 vessels, which included 11 oil tankers with a total capacity of 1,321,700 deadweight tons.

Libya has slipped into isolation while the Lockerbie affair remains unresolved. The trade embargo imposed on Libya the by the United States, the United Nations sanctions, and the Libyan Government's strong opposition to the normalization of Arab relations with Israel nurtured that country's political and commercial isolation. Italy's AGIP is hesitating on its large scale natural gas development which should yield 8,000 Mm³ annually for 30 years. AGIP has extensive interests in the United States and may be

significantly affected by proposed sanctions on non-U.S. companies investing in the Libyan oil and gas sector.

Libya has been overlooked in the many new economic initiatives that are generating new prosperity for its North African and Mediterranean neighbors. In particular, the new Mediterranean trade zone is providing access to generous amounts of European Union funding for development. Furthermore, Libya's neighbors launched privatization schemes to attract foreign investment and accelerate their economic development. In the long term, this could place Libya at a considerable competitive disadvantage. While Libya's export markets are relatively secure, earnings remain vulnerable to fluctuations in the price of oil, particularly since efforts to diversify its economy have not matched its ambitions.

¹Where necessary, values have been converted from Libyan dinars (LD) to U.S. dollars at the rate of LD0.35=US\$1.00.

Major Sources Of Information

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Major Publication

Salem, M. J., and M. T. Busrewil, (eds.). *The Geology of Libya*, v. I, II, and III. Al-Faeh University, Tripoli, Socialist People's Libyan Arab Jamahiriya, Academic, 1980.

TABLE 1
LIBYA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995 e/
Cement, hydraulic thousand metric tons	2,369	2,300	2,300	2,300	2,300
Gas, natural: e/					
Gross million cubic meters	15,570 r/	13,440 r/	12,410 r/	12,510 r/	12,500
Dry do.	6,540 r/	6,770 r/	6,360 r/	6,390 r/	63,500
Gypsum e/ thousand metric tons	180	180	160 r/	180	180
Iron and steel:					
Metal:					
Direct-reduced iron do.	777	846	944	852	970
Crude steel do.	718	822	920	874	860
Lime e/ do.	260	260	260	260	260
Nitrogen, N content of ammonia do.	130	347	350	350	350
Petroleum:					
Crude thousand 42-gallon barrels	547,610 r/	522,935 r/	496,765 r/	507,313 r/	507,000
Refinery products:					
Gasoline do.	15,293 r/	15,330 r/	15,480 r/	16,000 r/	16,000
Kerosene and jet fuel do.	13,797 r/	13,870 r/	13,578 r/	14,000 r/	14,000
Distillate fuel oil do.	29,711 r/	29,635 r/	28,908 r/	34,000 r/	34,500
Residual fuel oil do.	31,828 r/	31,680 r/	32,448 r/	38,000 r/	38,500
Other do.	10,330 r/	9,709 r/	9,272 r/	12,600 r/	12,800
Total do.	100,959 r/	100,224 r/	99,686 r/	114,600 r/	115,800
Salt thousand metric tons	12	12	15 r/	15 r/	15
Sulfur, byproduct of petroleum and natural gas e/ do.	14	14	14	14	14

e/ Estimated. r/ Revised.

1/ Table includes data available through June 5, 1996.

2/ In addition to the commodities listed, a variety of construction stone, brick, and tile was produced; but available information was inadequate to make reliable estimates of output levels. Natural gas liquids were also produced but were blended with crude petroleum and were reported as part of that total.