

THE MINERAL INDUSTRY OF

SYRIA

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In 1997, the mineral industry of Syria was dominated by the hydrocarbons sector, particularly with the development of nonassociated natural gas deposits in the north and northeast and the renewed interest in petroleum exploration. Other significant mineral industries include gypsum and phosphate rock mining, the manufacture of cement and fertilizers, and the manufacture of steel from domestic and imported scrap. The nation's gross domestic product (GDP) was approximately \$14,000 million. Mining and manufacturing accounted for about 14% of the GDP in 1996, the last year for which data were available.

Industrial pollution was a major problem in all phases of Syrian industry. Homs, the site of a petroleum refinery and several fertilizer factories, is Syria's most industrially polluted city. Pollution is not limited to Homs, however, because as three-quarters of the thermal power stations throughout Syria burn fuel oil with a high sulfur content. The country's older cement factories, using wet-process kilns, are major polluters. Syria was in the early stage of developing its environmental awareness and was establishing a governmental structure for monitoring and protecting the environment. The Ministry of Environment has begun to introduce unleaded gasoline; there are, however, still no exhaust emission controls (U.S. Embassy, Amman, Jordan, 1998).

Crude oil production peaked in 1995 at 610,000 barrels per day (bbl/d). Production in 1997 averaged 561,000 bbl/d. The Al-Furat Petroleum Co., a joint venture among Syrian Petroleum Co., Royal Dutch/Shell, and Deminex, is the country's largest producer, yielding an average of approximately 350,000 bbl/d of Syrian Light (36.4° API) crude oil in 1997, down from a peak of 400,000 bbl/d. The Syrian Petroleum Co. produced 150,000 bbl/d of heavy Suwaydiyah 24° API crude oil, and the Deir Es-Zor Petroleum Co. produced about 60,000 bbl/d of light crude oil. Details of Syrian mineral production are shown in table 1.

Exports of all goods in 1997 totaled nearly \$4 billion in value, of which approximately \$2 billion was derived from petroleum. Suwaydiyah crude oil averaged \$15.40 per barrel compared with \$17.74 per barrel in 1996. Syrian Light crude oil averaged \$19.12 per barrel compared with \$20.54 per barrel in 1996.

Export of Syria's other significant mineral product, phosphate rock, was nearly 2 million metric tons (Mt) in 1997, most of which was destined for Europe (Arab Petroleum Research Center, 1998).

Syria has a state socialist economic system with a growing private sector. In the mineral industry, however, private interests are only emerging in the cement, fertilizer, and power sectors. All mining, processing, and distribution companies are Government operated. Hydrocarbon exploration concessions, however, have been granted to foreign companies on behalf of the Syrian Government.

About 75% of Syria's cement requirements or about 5 Mt are met by the output from nine domestic plants. The largest of these is the Tartous Cement and Building Materials Co. with an annual cement production capacity of 2.1 Mt followed by the Al Shahba Cement and Building Materials Co. with 1.1 Mt. Increasing environmental considerations may force cement production to be concentrated in the larger and more-modern kilns and the smaller wet-process kilns are to be shut down.

Syria's fertilizer manufacturing industry is located at Homs. Two plants produce nitrogenous fertilizers, and the third produces phosphate fertilizer. A second phosphate plant was to be developed near Palmyra with phosphate feedstock delivered from the Khunaifis Mines, about 50 kilometers (km) south of Palmyra. This proposed 500,000-metric-ton-per-year (t/yr)-capacity triple superphosphate plant has undergone considerable delays; in October 1997, however, the Government announced that the triple superphosphate plant would be constructed. Syria plans to increase its phosphate output to 4 million metric tons per year (Mt/yr) by 2000 from 2.4 Mt/yr in 1997. Much of the increase is to be achieved by modernization of operations, including the introduction of new washing methods to improve quality (Mining Journal, 1997).

Natural gas production commenced its upward climb in 1997 as Syria's total natural-gas-processing capacity was increased to 5.9 billion cubic meters per year. Two new gas-processing plants came onstream in the Palmyra region in 1996 and 1997, and the Jbeisseh gas treatment plant was expanded by the installation of a second 1.2-million-cubic-meters-per-day (Mm³/d) processing train. The expansion, completed early in 1997 will enable the plant to process natural gas from the Tel Audeh, the Kahtaniyal, and the Leylak Fields. At the same time, the capacity of the natural gas pipeline to Homs was doubled to 2.5 Mm³/d through the installation of a booster station. Furthermore, 30 km of spur lines were laid to transport gas from the Jbeisseh-Homs gasline to Al Zara, near Hamah, where a gas-fired 800,000-t/yr steel plant and a 600-megawatt (MW) power station are under construction. The development of nonassociated gasfields west and north of Palmyra, including Al-Sharif, Al-Rasem, Al-Abbas, Kom Abu Arabat, Zamlakh, and Rasif, should raise Syria's dry natural gas production to about 5.8 billion cubic meters by 2000. Syria was also investigating the possibility of piping natural gas to Lebanon and Turkey. Gas pipeline projects tendered in early 1998 include a spur line from Baniyas to Beddawi in northern Lebanon where a 450-MW power station is under construction. Syria has agreed to provide at least 3 Mm³/d to Lebanon for the power station (Middle East Economic Digest, 1998).

In early 1997, Elf Hydrocarbures, a subsidiary of Elf Aquitaine of France, signed a contract with the Syrian Petroleum Company

for exploration and production rights to 4,200 square kilometers in northern Syria. Three-dimension seismic surveys were planned, and at least three exploration wells were to be drilled through 2000. Elf was operator of the permit with a 40% interest, with Sumitomo of Japan and Petronas of Malaysia each holding 30%.

The Al Khabour Petroleum Co. confirmed the commerciality of the Kishma Field in southeastern Syria. Initial production rate was 5,000 bbl/d rising to 12,000 bbl/d by the close of 1997. Crude oil is transferred to an adjacent processing facility by tanker truck, and the processed crude oil will flow via pipeline to the Mediterranean port of Banias.

Syria operates the 135,000-bbl/d Banias and the 107,000-bbl/d Homs refineries at their effective capacities. The refineries process a 60%/40% mixture of light and heavy crudes. Fuel oil accounts for nearly 45% of output. Surplus products are exported to Cyprus and Lebanon, and domestic consumption requires the import of about 5 million barrels per year of middle distillates. Plans have been made to remedy this imbalance by adding a conversion unit at Banias and a 28,000-bbl/d catalytic cracker at Homs.

Proven recoverable natural gas reserves were 234.7 billion cubic meters as of January 1, 1998. About 127.7 billion cubic meters is nonassociated gas, 60.3 billion cubic meter is cap gas, and the remaining 46.7 is associated gas. Recoverable petroleum reserves are 2.5 billion barrels. Syria's known hydrocarbon reserves are concentrated in seven major fields, the largest of which was Suwaydiyah in the extreme northeastern section of the country. Proven reserves of this field alone were reported to be 1 billion barrels of liquid hydrocarbons and 5.6 billion cubic meters of natural gas (Arab Oil & Gas Research Center, 1998).

Railway transportation was available in northern and western Syria, servicing the major cities and the three principal ports of Baniyas, Latakia, and Tartous. The existing hydrocarbon pipelines include the Iraq Petroleum Co. (IPC) pipeline traversing Syria from east to west. The pipeline had been closed for Iraqi use since 1982; sections of the pipeline were, however, converted to domestic use. More than 100 km of the IPC pipeline were used for natural gas transmission, forming part of the 377-km pipeline from the Jbeisseh gas-processing plant to the fertilizer complex and refinery in Homs. Another section of the IPC line transported crude oil to the Homs refinery from the Al-Them, the Al Asmara, and Al Ward Fields, which were connected by spur lines to the main pipeline. With the onset of production, two spur lines were constructed that connected the Al Them Field along with its smaller satellite fields and the Uma Field to the IPC pipeline.

Syrian power-generation capacity has been increased in recent years to the point of meeting demand. Total electricity production topped 21 billion kilowatt hour in 1997 and is projected to reach 27.8 billion kilowatt hour by 2000. Six large power-plants were planned in the early 1990's, two of which have since come on-stream—the 600 MW Bandar power station in 1996 and the 375-MW gas-fired Al Nasiriyah power station in early 1997.

Syria's economic growth has slowed to less than 2% following a period of more-rapid growth in the early 1990's. Declines in foreign aid and private investment have been the main

contributing causes. As petroleum reserves will be depleted in 12 years, at the present withdrawal rate, Syria will need increased exploration efforts to meet growing domestic demand and to maintain an export market that brings in about \$1.5 billion to \$2.0 billion per year. To this end, Royal Dutch/Shell, MOL Hungarian Oil Co., and Elf-Aquitaine won exploration contracts in 1997. The discovery of nonassociated natural gasfields and the increased use of associated natural gas was expected to reduce the demand for fuel oil and, thus, increase refined product export potential. The \$600 million refurbishing of the two petroleum-refining facilities will probably bring the petroleum product mix industry more in concert with domestic requirements, thus improving Syria's balance of payments position. The growing availability of natural gas feedstock combined with ample reserves of phosphate are factors that will encourage Syria to continue development of its fertilizer industry and to expand its export potential.

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