

THE MINERAL INDUSTRY OF

ISRAEL

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Israel was the world's second largest producer of bromine and the largest producer of elemental bromine. The nation also was fifth worldwide in the production of magnesium metal and potash and eighth in the production of phosphate rock (Jasinski, 2001; Kramer, 2001; Searls, 2001). Israel also produced high-quality industrial and edible salts, secondary lead, and minor quantities of crude oil and natural gas solely for domestic consumption. Other related mineral activities were the manufacturing of fertilizers, the cutting and polishing of imported diamonds, the refining of crude oil, and the production of steel.

Israel's gross domestic product (GDP) for 1999 was estimated to be \$99.1 billion. The estimated annual GDP growth rate was 2%, and gross exports were valued at \$25.8 billion (Central Bureau of Statistics, 2000, p. 8-5; World Bank Group, August 9, 2000, Israel at a glance, accessed November 2, 2000, via URL <http://www.worldbank.org/data/countrydata/countrydata.html>). Israel's leading exports were agricultural products, diamonds, and high-technology equipment. The slowdown in the national economy, which began in 1996, affected the construction sector in 1998 and caused home building activities to plummet by 7% (Lowe, 1999). In 1999, the construction sector continued to adjust allegedly on account of the lower level of demand caused by a decrease in immigration. Among other causes cited for the economic slowdown were the global financial shocks in Asia and Russia, which hit key export markets and affected the value of the shekel, and tighter fiscal and monetary policies (Lowe, 1999; U.S. Central Intelligence Agency, [undated], Israel report—World factbook 2000, accessed January 4, 2001, at URL <http://www.odci.gov/cia/publications/factbook/geos/is.html>).

Israel's steel consumption greatly exceeded its production capacity. Steel was produced at two domestic minimills, one on the northern coast at Akko and the other in Ashdod. United Steel Mills Ltd. in Akko had raw steel capacity of 200,000 metric tons per year (t/yr). Its rolling mill was capable of producing 125- by 125-millimeter (mm) billets in lengths of up to 8 meters, 8- to 28-mm-diameter rebar, 5.5- to 12-mm-diameter wire rod, and reinforcing mesh. Koor Industries Ltd. held 73.1% of the shares of United Steel Mills, and the public, the remaining 26.9%. Yehuda Steel Ltd. in Ashdod had meltshop capacity of 150,000 t/yr and rolling capacity of 350,000 t/yr. In 1999, the company's rolling mills were operating at about 70% of capacity. All the rebar produced was for domestic consumption. The company imported about 100,000 t/yr of billet from Russia, Turkey, and Ukraine (Karpel, 2000a). Among the company's future plans will be to upgrade its meltshop capacity to more than 250,000 t/yr and to replace its two small rolling mills by a single large one.

The Hakurnas Lead Works, which was founded in 1972, was

Israel's sole secondary lead producer. Of the total production, 70% was exported to Africa, Asia, and Europe. Two 7-metric-ton (t) rotary furnaces at the plant in Ashdod were used to process lead waste and produced around 10,000 t/yr of bullion, which was refined and shaped into 25-kilogram ingots. The company expected to increase its production by 50% by the end of 2000 (Karpel, 2000b).

Two of the Israeli companies involved in the production of minerals extracted from the Dead Sea were Haifa Chemicals and Israel Chemicals Ltd. (ICL). Haifa Chemicals was the world's largest supplier of potassium nitrate with a potassium nitrate output of 700,000 t/yr (Phosphorus & Potassium, 1999). In mid-April 1999, the Ofer Brothers Group of Israel acquired 53% equity interest in The Israel Corp. Ltd., which was the parent company of ICL.

A number of ICL subsidiaries were clustered on the south shore of the Dead Sea. Mineral production included bromine, magnesium chloride, potash, potassium chloride, and salt. Dead Sea Works Ltd., in which ICL owned 89.1% equity interest, planned to invest about \$90 million in expanding its potash production capacity by 300,000 t/yr. The company produced about 2.45 million tons per year (Mt/yr) (Phosphorus & Potassium, 1999). Dead Sea Bromine Co. Ltd., which was also a subsidiary of ICL, was one of the world's leading producers of bromine and accounted for about 35% of the world's elemental bromine. DSB's main markets were Europe, the Far East, and North and South America. The company held a subconcession for the extraction of bromine and bromine compounds from the Dead Sea effective until 2030 and had a service agreement with Dead Sea Works until 2006 (Dead Sea Bromine Co. Ltd., 2000, Directors report on the state of affairs of the group for the year ended December 31, 1999, accessed January 8, 2001, at URL <http://www.dsb.com/brome/files.nsf/lookup/financial.htm?OpenDocument>). Dead Sea Magnesium Ltd., which was a joint venture between the Magnesium Division of Dead Sea Works (65%) and Volkswagen AG of Germany (35%), has successfully increased production of magnesium metal each year since the plant opened in December 1996.

In 1999, polished diamond exports rose by 22% to \$4.5 billion, and total diamond exports were \$7.8 billion. Gross diamond imports in 1999 were valued at \$5.8 billion (Central Bureau of Statistics, 2000, p. 8-16, 8-17). The United States' purchase of 64% of Israel's polished diamond production made it Israel's largest market. The Far East, which was the second largest market, purchased 19%, and exports to Europe diminished by 14% (Tsurial Kenen, January 4, 2000, Industry & Trade Minister—22% rise in polished diamond exports in '99 to \$4.5 bln—Israel's business arena, accessed May 18, 2000, at URL http://www.globes.co.il/cgi-bin/Serve_Archive_Arena/

pages/English/1.2.1.10/20000103/2). Israel's diamond organizations were represented by the Israel Diamond Institute. The Institute's activities involved research and development, as well as marketing and diamond certification. In 1999, Israel bought about 25% of all the gem-quality rough diamonds from De Beers Central Selling Organization (Mining Journal, 2000).

A number of companies had active exploration programs underway in 1999. Isramco, Inc., which operated the Med Yavne (block 239) license, drilled the Yam-West 2, the Or-1, and the Or-South wells. In October 1999, the company transferred 50% of its drilling rights on the Med Yavne and four other offshore exploration licenses [the Med Tel Aviv (block 240), the Med Hadera (block 241), the Med Ashdod (block 242), and the Med Hasharon (block 243)] to BG International Ltd. (PRNewswire, October 20, 1999, Isramco, Inc. reports sale of interests in off-shore Israel licenses to BG International Ltd.—subsidiary of BG plc., accessed October 21, 1999, at URL http://biz.yahoo.com/prnews/991020/tx_isramco_1.html). Other companies with equity interest in the licenses were Equital Ltd., Isramco-Negev 2 Ltd., Jerusalem Oil Exploration Ltd. (J.O.E.L.), Naphtha Explorations Ltd. Partnership, and Naphtha Israel Petroleum Corp. Ltd. Partnership. In the past, Israel did not have significant domestic energy resources and had imported coal from Australia, Colombia, Indonesia, Poland, South Africa, and United States and oil from Norway, Mexico, and the United States. On October 31, 1999, the discovery of natural gas from the offshore Or-1 exploration well near the town of Askelon was announced by Isramco. The discovery, together with an earlier discovery made in June by Avner Oil Exploration Ltd. and Delek Drilling Ltd., was expected to produce commercial quantities of natural gas that would partially satisfy the anticipated increased demand for gas as Israeli Electricity Co. began to convert oil-fired electricity generating plants to natural gas (U.S. Energy Information Administration, October 2000, Israel, accessed January 8, 2001, at URL <http://www.eia.doe.gov/emeu/cabs/israel2.html>).

In 1998, Israel's Ministry of National Infrastructure evaluated prequalification bids for the construction and operation of a new natural gas distribution network in Israel. Groups that participated in the bidding included the partnership of Amoco Corp. of the United States and Paz Oil Co. of Israel; the joint venture of Italgas S.p.A. of Italy and the Ofer Brothers Group of Israel; Bridges of the United Kingdom; the joint venture of Mashav of Israel, Clal (Israel) Ltd., the Danker Group of Israel, and BG Plc of the United Kingdom; and the joint venture of Gaz de France, Reliant Energy International Inc. (which was formerly Houston Industries Energy, Inc., of the United States), and the American Israeli Gas Corp. Ltd. (Petroleum Economist, 1998).

Israel's oil reserves have been estimated to be 5 billion barrels (U.S. Energy Information Administration, October 2000, Israel, accessed January 8, 2001, at URL <http://www.eia.doe.gov/emeu/cabs/israel2.html>). Oil production, which was approximately 600 barrels per day (bbl/d) from the vicinity of the town of Arad, was commercially insignificant. The partially

privatized Oil Refineries Ltd. was Israel's sole crude oil refining company. Despite the Government's interest in liberalizing the energy sector, the company's two refineries were still 74% owned by the state. The Ashdod refinery had a refining capacity of 90,000 bbl/d. The Haifa refinery had a capacity of 180,000 bbl/d and operated a powerplant that provided its own electricity needs (Israel Finance Ministry, International Division, 1997, Energy, accessed January 4, 2001, at URL <http://www.mof.gov.il/beinle/mof4.html>).

Electricity generation and supply in Israel was provided by the Israel Electric Corporation (IEC), which was a state-owned public utility. The country generated most of its electricity from two coal-fired plants in Hadera and one in Ashkelon and three oil-fired plants in Ashdod, Haifa, and Tel Aviv. In 1999, coal-fired plants comprised about 70% of the electric system capacity, and fuel oil-fired units produced 25%. Additional power was provided by diesel-fuel-fired plants, industrial cogeneration, and solar units (U.S. Energy Information Administration, October 2000, Israel, accessed January 8, 2001, at URL <http://www.eia.doe.gov/emeu/cabs/israel2.html>). IEC's 29 power stations had an electricity generating capacity of about 8.6 gigawatts. In 1999, several power generation sector initiatives were being considered. These initiatives included importing natural gas from Egypt, possible cooperation with Jordan to share a shale-oil-fired plant, the possibility of linking the two countries' power grids and joint power stations, and the development of joint wind power with Syria.

Industrial harbors at Ashdod, Eilat, and Haifa are part of Israel's infrastructure. Ashdod was the principal fertilizer export facility in the country. Plans for renovation of the ports infrastructure were being carried out. Ashdod had a daily discharge rate of 27,000 t, and a throughput capacity of 4 Mt/yr, and Hadera had a daily discharge rate of 28,989 t and a throughput capacity of 6.3 Mt/yr.

References Cited

- Central Bureau of Statistics, 2000, Statistical abstract of Israel: Jerusalem, Central Bureau of Statistics, 124 p., 26 chapters of tables.
- Jasinski, S.M., 20d Phosphate rock: U.S. Geological Survey Mineral Commodity Summaries 2001, p. 120-121.
- Karpel, Steve, 2000a, Israeli steel feels the drought: Metal Bulletin Monthly, no. 349, January, p. 34-37.
- 2000b, Israel to boost battery recycling: Metal Bulletin Monthly, no. 349, January, p. 51-53.
- Kramer, D.A., 2001, Magnesium metal: U.S. Geological Survey Mineral Commodity Summaries 2001, p. 100-101.
- Lowe, Monica-Lucie, 1999, A fresh start: Middle East Economic Digest, v. 43, no. 39, October 1, p. 2-3.
- Mining Journal, 2000, Israel getting rough: Mining Journal [London], v. 334, no. 8569, February 11, p. 110-111.
- Petroleum Economist, 1998, News in brief—Israel: Petroleum Economist, v. 65, no. 5, May, p. 45.
- Phosphorus & Potassium, 1999, Potash alternatives: Phosphorus & Potassium, no. 219, January-February, p. 26-30.
- Searls, J.P., 2001, Potash: U.S. Geological Survey Mineral Commodity Summaries 2001, p. 124-125.

TABLE 1
ISRAEL: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1995	1996	1997	1998 e/	1999 e/
METALS					
Iron and steel, steel, crude e/	200,000	203,000	203,000	203,000	200,000
INDUSTRIAL MINERALS					
Bromine: e/					
Elemental	130,000	160,000	180,000 3/	185,000 3/	185,000
Compounds	121,000	145,000	150,000	175,000	150,000
Caustic soda	44,961	45,000	45,000 e/	45,000	15,000
Cement, hydraulic	thousand tons	6,204	6,700 e/	5,400	5,100
Clays: e/					
Flint clays	40,000	40,000	40,000	40,000	40,000
Kaolin	40,000	40,000	40,000	40,000	40,000
Other	8,500	8,500	8,500	8,500	8,500
Fertilizers materials, manufactured:					
Nitrogenous, N content of ammonia and urea	69,700	64,600 e/	56,600	500 r/ 3/	-- 3/
Phosphatic, P content e/	33,000	33,000	33,000	33,000	33,000
Potassic, K content e/	17,000	17,000	17,000	17,000	17,000
Gypsum e/	50,000	50,000	60,000	60,000	50,000
Lime e/	210,000	275,000	275,000	275,000	275,000
Magnesia, Mg content e/	42,200	42,200	43,000	43,000	43,000
Magnesium metal	--	100 r/ e/	8,000	25,000 r/	28,000
Phosphate rock:					
Beneficiated	thousand tons	4,063	3,839	4,047	4,050
P ₂ O ₅ content	do.	1,264	1,200	1,250	1,250
Potash, K ₂ O equivalent	do.	1,325	1,500	1,488	1,668 r/ 3/
Salt, marketed (mainly marine) e/	do.	900	800	800	800
Sand:					
Glass sand	222,900	225,000 e/	225,000 e/	225,000	230,000
Other e/	thousand tons	7,060	7,060	7,100	7,000
Sodium and potassium compounds, caustic soda e/	32,800	32,800	32,800	32,800	32,800
Stone: e/					
Crushed	thousand tons	31,500	31,500	31,500	35,000
Dimension, marble	do.	12,000	12,000	12,000	12,000
Sulfur: e/					
Byproduct from petroleum	do.	60	60	60	31 3/
Sulfuric acid	do.	130	130	130	130
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural: e/					
Gross	thousand cubic meters	21,300	20,000	20,000	20,000
Dry	do.	21,300	20,000	20,000	20,000
Petroleum:					
Crude	thousand 42-gallon barrels	36	36 e/	36 e/	36
Refinery products:					
Gasoline	do.	20,500	20,600 e/	17,500 r/	18,000 r/
Kerosene	do.	9,400	9,400 e/	8,000 r/	8,000 r/
Distillate fuel oil	do.	23,400	23,500 e/	21,000 r/	23,500 r/
Residual fuel oil	do.	24,500	24,500 e/	25,000 r/	25,000
Other	do.	13,100	13,200 e/	12,000 r/	13,000 r/
Total	do.	90,900	91,200 e/	83,500 r/	87,500 r/

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

1/ Table includes data available through January 31, 2001.

2/ In addition to the commodities listed, a variety of other crude construction materials are produced, but available information is inadequate to make estimates of output. Also, about 10,000 metric tons per year of secondary lead is recovered.

3/ Reported figure.