

## THE MINERAL INDUSTRY OF

# ISRAEL

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Israel's indigenous minerals industry was, for the most part, based on the extraction of bromine, magnesium, and potassium from the waters of the Dead Sea. Israel was the world's second largest producer of bromine following the United States. Other indigenous mineral activities were phosphate rock mining, the manufacture of cement and fertilizers, and the production of minor quantities of crude oil and natural gas. (See table 1.) A significant mineral-related industry was the cutting of diamonds and the fabrication of jewelry from imported materials. Israel opened an exchange for rough diamond in Tel Aviv offering the first tenders in late June 1998 and similar tenders about every 5 weeks thereafter; tenders allow diamond to be sold to nonbourse members who are not subject to the stringent rules of official diamond dealers.

In 1997, the latest year for which complete trade data are available, the total value of net imports by Israel was \$28.06 billion. Worked and rough diamonds accounted for about 18% of imports, or nearly \$5.1 billion, of which \$2.9 billion was imported from Belgium/Luxembourg. Imports of fuel and lubricants accounted for \$2.3 billion; this included 9 million metric tons (Mt) of steam coal delivered to the country's two coastal powerplants at Ashkelon and Hadera. About one-half of the steam coal imports are derived from Colombia, South Africa, and the United States, each delivering about 1.5 Mt. By 2001, coal consumption is expected to reach 11 million metric tons per year (Mt/yr).

In 1997, Israeli exports were valued at \$20.8 billion. Diamond exports were valued at \$5.7 billion; chemical and chemical products, at \$2.7 billion; mining and quarrying, at \$353 million; and refined petroleum and nuclear fuel exports, at \$117 million (Central Bureau of Statistics, 1999, p. 8-7 to 8-19). The port of Ashdod was the principal fertilizer export facility in Israel. In 1997, 1.3 Mt of phosphate and 1.4 Mt of potash fertilizers were loaded and shipped from Ashdod.

About two-thirds of the domestic requirement for steel reinforcing bars were supplied by Yehuda Steel Ltd. and United Steel Mills Ltd; the remaining one third was imported, amounting to 259,000 metric tons in 1997, nearly one-half of which was from Turkey. Israeli manufacturers of rebar pressured the Ministry of Industry and Trade to impose antidumping duties (Metal Bulletin, 1998). The Dead Sea Bromine Group entered into a \$30 million joint venture with Shandong Haihua Shareholding Co. of China to sell bromine in that country. The Dead Sea Bromine Group's production capacity was 250,000 metric tons per year (t/yr) of elemental bromine, accounting for about 30% of the world's production of

bromine.

Cement demand declined appreciably as sales in 1998 totaled 5.10 Mt compared with 5.52 Mt in 1997. Cement production was controlled by just one producer, Nesher Israel Cement Enterprises Ltd., operating three plants. The Ramla Works with its one modern dry-process line and a further three wet lines had a combined capacity of 4 Mt/yr. The Nesher Works near Haifa operated with three wet production lines and could produce up to 2 Mt/yr of cement. The Har-Tuv Works near Jerusalem could produce 1 Mt/yr. Clinker production of about 3.6 Mt/yr was made up from the Nesher and Ramla wet-process units (1.5 Mt/yr), the Ramla dry-production line (1.5 Mt/yr), and the semidry kiln at Har-Tuv (0.6 Mt/yr).

Dead Sea Magnesium, a joint venture between the Magnesium Division of the Dead Sea Works (65%) and Volkswagen AG of Germany (35%), inaugurated production of magnesium metal in 1997 at the Demona Plant near S'dom. The project developed cost overruns and technical problems. The company reported that the project would not be profitable before 1999. Israel's Industry and Trade Ministry approved an additional \$65 million in funding to expand the capacity from 27,000 to 35,000 t/yr (Magnesium Monthly Review, 1998). Because the plant was over budget, construction was suspended in 1998 while the company sought additional investment partners for the plant. The company was considering the sale of 25% equity in its 27,000-t/yr-capacity plant to Unitech of Austria (Industrial Minerals, 1998).

Dead Sea Works sold approximately 850 t/yr of mineral-enriched brine to a magnesia plant at Mishor Rotem operated by its associate Dead Sea Periclase Ltd. During 1997, the third Aman reactor came on-stream, increasing capacity to about 95,000 t/yr of high-purity sintered magnesia serving the refractory industry and specialty magnesia markets. A 13,000-t/yr fused magnesia plant, also at Mishor Rotem, was operated by Tateho Dead Sea Fused Magnesia Co., a partnership between Dead Sea Periclase and Tateho Chemical Industries, Co. Ltd. of Japan.

Dead Sea Works announced plans to significantly expand production of potash at its S'dom operation from 2.3 to 2.8 Mt/yr (Industrial Minerals, 1997). Dead Sea Works also produced and exported about 110,000 t/yr of table, industrial, and road salt to markets in Nigeria and Norway.

Traditionally, all electric power in Israel has been generated from heavy fuel oil; however, in recent years, all new major generating capacity has been based on coal. Up to 75% of Israel's electricity supply was generated by coal-fired

<sup>1</sup>Deceased.

powerplants; the remainder, by fuel oil. Five generating plants were in existence—the Haifa, Tel Aviv, and Ashdod are oil fired, and the Hadera and Ashkelon are coal fired. Installed generating capacity in 1997 was 7,804 megawatts, and production was 35.1 billion kilowatthours (Central Bureau of Statistics, 1999, p. 15-5). With additional units set to come on-stream in the next few years, coal will remain a consistent part of Israel's energy supply base. However, with no indigenous energy resources of its own, Israel Electric Corporation will need to explore opportunities for the development of natural gas supplies to the country. Possible supply sources are Egypt, Qatar, or Russia. Coal could be reduced to 50% of the total energy source (International Bulk Journal, 1998).

Oil and natural gas reserves were reported to be 4 million barrels and 311 million cubic meters (Tippee, 1998).

Israel's demand for bulk cargoes, such as coal for electricity generation and cement and slag for the construction industry, has prompted a wide range of development projects to enable the ports to meet the country's future needs. Some of the funding for these projects have been reduced as foreign direct

investment in Israel during 1998 totaled \$2 billion compared with \$3.5 billion in 1997 as part of the worldwide trend of reduced foreign investment owing to the world economic crises in 1998.

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TABLE 1  
ISRAEL: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998 e/	
<b>METALS</b>						
Iron and steel, steel, crude e/	180,000 3/	200,000	203,000	203,000	203,000	
<b>INDUSTRIAL MINERALS</b>						
Bromine: e/						
Elemental	130,000	130,000	160,000	180,000 r/ 3/	185,000 3/	
Compounds	121,000	121,000	145,000	150,000	175,000	
Caustic soda	32,765	44,961	45,000	45,000 e/	45,000	
Cement, hydraulic	thousand tons	4,800	6,204	6,700 e/	5,400 r/	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	50,000 e/	69,700	64,600 e/	56,600	55,000	
Phosphatic, P content e/	30,300	33,000	33,000	33,000	33,000	
Potassic, K content e/	16,000	17,000	17,000	17,000	17,000	
Gypsum e/	48,000	50,000	50,000	60,000	60,000	
Lime e/	210,000	210,000	275,000 r/	275,000	275,000	
Magnesia, Mg content e/	42,200	42,200	42,200	43,000	43,000	
Magnesium metal	--	--	--	8,000	15,000	
Phosphate rock:						
Beneficiated	thousand tons	3,961	4,063	3,839	4,047	4,050
P <sub>2</sub> O <sub>5</sub> content	do.	1,232	1,264	1,200	1,250	1,250
Potash, K <sub>2</sub> O equivalent	do.	1,259	1,325	1,500	1,488	1,500
Salt, marketed (mainly marine) e/	do.	1,120	900 r/	800	800	800
Sand:						
Glass sand	176,300	222,900	225,000 e/	225,000 e/	225,000	
Other e/	thousand tons	7,060	7,060	7,060	7,060	7,100
Sodium and potassium compounds, caustic soda e/	32,765 3/	32,800	32,800	32,800	32,800	
Stone: e/						
Crushed	thousand tons	31,500	31,500	31,500	31,500	31,500
Dimension, marble	do.	12,000	12,000	12,000	12,000	12,000
Sulfur: e/						
Byproduct from petroleum	do.	60	60	60	60	60
Sulfuric acid	do.	130	130	130	130	130
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Gas, natural: e/						
Gross	thousand cubic meters	21,300	21,300	20,000	20,000	20,000
Dry	do.	21,300	21,300	20,000	20,000	20,000
Petroleum:						
Crude	thousand 42-gallon barrels	37	36	36 e/	36 e/	36
Refinery products:						
Gasoline	do.	19,800	20,500	20,600 e/	20,800 e/	20,800
Kerosene	do.	5,200	9,400	9,400 e/	9,500 e/	9,500
Distillate fuel oil	do.	20,500	23,400	23,500 e/	23,800 e/	23,800
Residual fuel oil	do.	28,000	24,500	24,500 e/	25,000 e/	25,000
Other	do.	13,000	13,100	13,200 e/	13,300 e/	13,300
Total	do.	86,500	90,900	91,200 e/	92,400 e/	92,400

e/ Estimated. r/ Revised.

1/ Table includes data available through June 30, 1999.

2/ In addition to the commodities listed, a variety of other crude construction materials are produced, but available information is inadequate to make reliable estimates of output levels.

3/ Reported figure.