THE MINERAL INDUSTRY OF

ISRAEL

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Israel was a producer of such metals and metal products as lead, magnesium, steel, and zinc and such industrial minerals as bromine, flint clay, gypsum, kaolin, magnesia, phosphate rock, potash, silica sand, and sulfur. Building materials produced in Israel included cement, crushed stone, marble, and sand. The country also cut imported diamond and produced bromine derivatives, caustic soda, fertilizers, natural gas, petroleum and petroleum products, phosphoric acid and sulfuric acid.

In 2002, Israel's gross domestic product (GDP) at purchasing power parity amounted to $118.9 billion; per capita GDP was $18,100 at purchasing power parity. The GDP decreased by 1% in 2002 and 0.9% in 2001 after increasing by 7.4% in 2000 and 2.6% in 1999. In 2002, the constant dollar value of production in the nonmetallic mineral products and basic metals industries fell by 5.5% and 9%, respectively. Production rose by 7.9% in the mining and quarrying sector and by 12.5% in the industrial chemicals and fertilizers sector. Chemicals and refined petroleum accounted for 9.89% of industrial production; nonmetallic minerals, 3.74%; mining and quarrying industry, 2.74%; and basic metals, 2.08% (International Monetary Fund, 2003, p. 174; 2003§;[1] Israel Central Bureau of Statistics, 2003, p. 20.13-20.15).

In 2002, Israel's net exports amounted to $29.35 billion. The value of mining and quarrying exports amounted to $329.9 million; basic metals, $238.9 million; nonmetallic mineral products, $116.4 million; and refined petroleum products, $109.4 million. Net imports amounted to $32.56 billion, of which mineral fuels accounted for about $3.05 billion (Israel Central Bureau of Statistics, 2003, p. 16.18-16.19).

Commodity Review

Metals

Iron and Steel.—Yehuda Steel Ltd. operated rolling mills at Ashdod and Gedera that produced rebar for domestic consumption; the company also produced crude steel. Israel-based Hod Metals operated a rolling mill at Kiryat Gat. In December 2002, Yehuda and Hod took over the plants in Akko owned by United Steel Mills Ltd. (USM), which had entered liquidation in August 2001. Yehuda purchased USM's rolling mill for $1.1 million, and Hod purchased the smelter for nearly $900,000. The plants were sold without the land; the Haifa District Court required Yehuda to remove the rolling mill's equipment from the site by April 2003. Hod was required to operate the smelter's equipment in Israel (Peretz, 2002§).

The International Iron and Steel Institute (2002, p. 82, 86, 92) estimated that Israel's imports of semimanufactured and finished steel products increased to nearly 1.49 million metric tons (Mt) in 2001 from 1.42 Mt in 2000 and 1.21 Mt in 1996. From 1996 to 2001, Israel's apparent consumption of crude steel rose to 1.94 Mt from 1.6 Mt. During the same period, national consumption of finished steel increased to 1.74 Mt from 1.43 Mt.

Lead.—In 2002, Harkunas Lead Works, which was Israel's secondary lead smelter, increased its output to 22,000 metric tons (t) from 20,000 t in 2001. In recent years, the plant's exports were shipped to Greece, Italy, and Spain. National lead consumption increased to 15,000 t in 2002 from 14,000 t in 2000 and 2001 and 12,000 t in 1999 (International Lead and Zinc Study Group, 2003, p. 6, 8; International Trade Center and United Nations Statistics Division, undated).

Magnesium.—Dead Sea Magnesium Ltd. (DSM) was Israel's only producer of magnesium metal; DSM was owned by Israel Chemicals Limited (ICL) (65%) and Volkswagen AG of Germany (35%). In 2002, DSM announced plans to switch its captive powerplant from petroleum products to natural gas in 2004. The company did not plan to raise output because of unfavorable market conditions (Milbank, 2002).

Brines from the Dead Sea were used by Dead Sea Periclase Ltd. (DSP) (a subsidiary of ICL) in the production of magnesia. In recent years, DSP produced 95,000 metric tons per year (t/yr) of magnesia, of which about 65,000 t/yr was dead-burned magnesia. About 13,000 t/yr of dead-burned magnesia was fused by Taheto Dead Sea Fused Magnesia Co., which was a joint venture between DSP (50%) and Taheto Chemical Industries of Japan (50%). In 2002, magnesia production fell mainly because of weakness in the world refractory market (Israel Chemicals Ltd., 2003, p. 12).

Zinc.—Numinor Chemical Industries Ltd. used zinc scrap to produce refined zinc ingots, zinc oxide, zinc powder, and other zinc-containing materials. The company exported its products to African, Asian, and European countries. From 1999 to 2002, Israel consumed 11,000 t/yr of refined zinc. In 2001, imports of refined zinc amounted to 5,733 t at a value of nearly $6.1 million (International Lead and Zinc Study Group, 2003, p. 40; International Trade Center and United Nations Statistics Division, undated).

Industrial Minerals

Bromine.—Israel, which was the world's second largest bromine producer after the United States, accounted for 37% of world bromine production in 2002. Brines and carnallite from the Dead Sea were extracted by the Dead Sea Bromine Group

[1]References that include a section mark (§) are found in the Internet References Cited section.

(DSBG) (a subsidiary of ICL). The company produced bromine and bromine derivatives with applications in air conditioning, batteries, cleaning solvents, flame retardants, mineral separation, oil drilling, photography, and water treatment. In 2002, DSBG's sales of bromine derivatives used in oil drilling fell. The demand for flame retardants increased (Israel Chemicals Ltd., 2003, p. 11; Lyday, 2003).

Cement.—Nesher Israel Cement Enterprises Ltd., which was the country's sole producer of cement, operated plants in Haifa, Har-Tuv, and Ramla. The International Cement Review (2003) estimated that Israel's cement consumption was 4.47 Mt in 2002 compared with 4.38 Mt in 2001 and 4.52 Mt in 2000. Housing accounted for about 50% of national cement demand, and infrastructure and defense, 33%. In 2002, about 300,000 t of consumption shifted to defense from housing because of civil unrest. Exports, which were destined mostly for the West Bank and Gaza Strip, fell to 953,000 t in 2002 from 1.42 Mt in 2001. The majority of cement and clinker imports were sourced from Cyprus, Jordan, Romania, and Turkey.

Diamond.—Israel continued to grow as a diamond trading center as the domestic cutting industry declined and shifted toward higher value stones. In 2002, the value of imported rough diamond amounted to $4.39 billion, which was an increase from $3.8 billion in 1997. About $1.62 billion of rough diamond was reexported in 2002. From 1997 to 2002, the value of exported polished diamond increased to $5.21 billion from $4.1 billion. About $2.39 billion of polished diamond was reexported in 2002. Exports of polished diamond that were derived from local production fell to about 1.19 million carats at a value of $2.82 billion in 2002 from 2.37 million carats at a value of $3.24 billion in 1997 (Even-Zohar, 2000§, International Diamond Exchange, 2003a§, b§).

Israel's diamond manufacturers faced serious competition from such countries with lower labor costs as China and India; many small- to medium-sized manufacturers have gone bankrupt. Advances in polishing technology were needed to push costs down to the range of $12 to $14 per carat. The supply of rough diamond was another problem; in 2002, Israel received only 16.5% of rough from Diamond Trading Company (a subsidiary of DeBeers Group). Smaller manufacturers were considering Canada as an alternative source (Slater, 2003§).

Phosphate Rock.—Israel's phosphate rock resources were mined by Rotem Amfert Negev Ltd. (a subsidiary of ICL). Rotem produced phosphoric acid and such fertilizers as monopotassium phosphate, single superphosphate, and triple superphosphate (TSP). Haifa Chemicals Ltd. also produced phosphoric acid and phosphate fertilizers.

In 2002, Rotem's beneficiated production of phosphate rock fell to about 3.48 Mt from 3.51 Mt in 2001; more than one-fourth of the company's output was exported. Brazil accounted for more than 40% of beneficiated phosphate rock exports; the Netherlands, about 30%; and Taiwan, nearly 10%. In 2002, more than one-third of Israel's phosphoric acid production was exported. India accounted for more than 50% of national phosphoric acid exports; the Netherlands, nearly 20%; and Turkey, about 10%. Israel also exported TSP and monoammonium phosphate; Australia, Brazil, and France were the principal destinations for TSP exports.

Potash.—Carnallite (a potassium mineral) from the Dead Sea was used as raw material for Dead Sea Works' (DSW) potash plants. In 2002, potash production rose to about 1.92 Mt from 1.77 Mt in 2001; most of DSW's output was exported. Brazil accounted for 28% of Israel's potash exports; India, 12%; China, 11%; and the Netherlands, 9%. Haifa Chemicals, which was the world's largest producer of potassium nitrate, consumed DSW's potash.

Salt.—More than 500,000 t/yr of salt was produced for use in deicing, electrolysis, fish pickling, and water softening, and as table salt. DSW was the largest salt producer in Israel. The company obtained salt that was separated from carnallite during the potash production process. Israel Salt Industries (ISI) operated three highly mechanized solar evaporation plants at Atlit, Eliat, and Kalia that extracted salt from seawater. More than 15% of ISI's output was exported to Africa, Europe, and the Far East. ISI recently expanded its production capacity with new evaporation ponds and a salt washing and packing plant at Eliat that cost $13 million (Harben and Harris, 2002).

Silica.—Negev Industrial Minerals (NIM) (a subsidiary of ICL) mined and beneficiated silica sand, which was consumed by the ceramics, construction, diecasting, and flat and container glass industries. NIM's silica sand was used by Phoenicia America-Israel (Flat Glass) Ltd., which was Israel's sole producer of float and pattern glass. In 2002, production amounted to 160,000 t. Sales were $67 million, of which $45 million were exports (Dun and Bradstreet Israel Ltd., 2003§).

Sulfur.—From 1998 to 2002, Israel's production of sulfur increased to 36,000 t from 32,000 t. Sulfur was produced at the Ashdod and Haifa refineries, which were operated by Oil Refineries Ltd. Most of Israel's demand for sulfur was met through imports, which were sourced from Canada, Germany, and Russia.

Sulfuric acid was produced by Rotem for the manufacture of fertilizers; nearly three-quarters of Israel's sulfuric acid was consumed in fertilizer production. In 2001, Israel consumed about 1.9 Mt of sulfuric acid, which was an increase from 1.88 Mt in 2000 and 1.34 Mt in 1997.

Mineral Fuels

Coal.—Israel had no coal reserves and was dependent upon imports for all of its coal requirements. The country's consumption of coal increased to 12.2 Mt in 2002 from 11.57 Mt in 2001 and 8.64 Mt in 1997 (Israel Electric Corporation, 2003, p. 15).

Natural Gas.—At the end of 2002, Israel's reserves of natural gas amounted to nearly 39 billion cubic meters. In June 2002, Israel Electric Corporation (IEC) signed an agreement to purchase nearly 1.8 billion cubic meters per year of natural gas from Yam Thetis, which was a joint venture between Semedan Mediterranean (47%), Delek Drilling Ltd. (25.6%), Avner Oil

Exploration LP (23%), and Delek Investments and Properties Ltd. (4.4%). The Noa and Mari-B blocks would supply the gas to IEC's powerplants in early 2004. IEC was expected to account for 70% of Israel's natural gas consumption (Radler, 2002, p. 114; Teibel, 2002).

In 2002, British Gas Group (BG) explored within the Gaza Marine license, which was under the jurisdiction of the Palestinian Authority; further exploration was planned in 2003. In early 2002, BG sold its interest in the Med Ashdod exploration license, which was in Israeli waters. The company planned to drill a well in the Matan offshore exploration block in 2003 (British Gas Group plc, 2003, p. 23).

Petroleum.—From 1998 to 2002, Israel's production of petroleum declined by about 31% (table 1). Israel's petroleum reserves were not significant; most of the country's demand for crude petroleum was met through imports. At the end of 2002, Israel's reserves of crude petroleum were estimated to be 3.81 million barrels (Radler, 2002, p. 114).

Oil Refineries Ltd. operated refineries in Haifa and Ashdod with capacities of 130,000 barrels per day (bbl/d) and 90,000 bbl/d, respectively. In 2002, Israel's exports of petroleum products were $109.4 million compared with $91.1 million in 2001 and $116.3 million in 1997 (Israel Central Bureau of Statistics, 1998, p. 8.8; 2003, p. 16.18).

Infrastructure

In 2002, IEC produced 43,867 gigawatthours (GWh) of electricity, which was an increase from 42,209 GWh in 2001 and 33,607 GWh in 1997. Coal-fired powerplants accounted for 80% of electricity generated; diesel, 16%; and natural gas and combined cycle, 4%. From 1997 to 2002, installed generating capacity increased to 9,952 megawatts (MW) from 7,854 MW. The largest powerplants were located at Orot Rabin, which had a capacity of 2,590 MW; Rutenberg, 2,300 MW; Eshkol, 1,206 MW; Reading, 528 MW; and Haifa, 426 MW (Israel Electric Corporation, 2003, p. 11-12, 63).

In 2002, Israel consumed 39,920 GWh of electricity, which was an increase from 38,665 GWh in 2001 and 30,822 GWh in 1997. The chemicals and petroleum sector consumed 1,789 GWh; nonmetallic mineral products, 681 GWh; mining and quarrying, 443 GWh; basic metals, 208 GWh; and diamond, 40 GWh (Israel Electric Corporation, 2003, p. 31, 42).

Israel's transportation network comprised nearly 16,000 kilometers (km) of paved highways and 610 km of railroads. There were 708 km of pipelines for crude oil, 290 km for petroleum products, and 89 km for natural gas.

Outlook

The outlook for Israel's bromine, lead, magnesium, phosphate, potash, and salt industries depends heavily upon world market conditions for these commodities, and the cement, crushed stone, gypsum, lime, and marble industries are more dependent upon the strength of the Israeli economy. The International Monetary Fund (2003, p. 158) predicted that Israel's GDP would grow by 0.7% in 2003 and 2.1% in 2004. The global consumption of phosphate fertilizers was expected to increase by 2.7% per year between 2003 and 2008; output of phosphate rock and phosphoric acid are expected to grow at a similar rate (Jasinski, 2003, p. 57.4).

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TABLE 1
ISRAEL: PRODUCTION OF MINERAL COMMODITIES [1]

(Metric tons unless otherwise specified)

Commodity[2]		1998	1999	2000	2001[e]	2002[e]
METALS						
Iron and steel, steel, crude		280,000	280,000	270,000 [e]	220,000	150,000
Lead, refined secondary		12,000	13,000	13,000	20,000 [3]	22,000 [3]
Magnesium metal		24,500	24,800	31,700	34,000 [r, 3]	34,000
INDUSTRIAL MINERALS						
Bromine:						
Elemental		185,200	181,000	210,000	206,000	200,000
Compounds[e]		247,000	247,000	250,000	250,000	250,000
Caustic soda[e]		41,700	41,200	44,200	44,900	50,500
Cement, hydraulic	thousand tons	6,476	6,354	5,703 [r]	4,700 [r]	5,150
Clays:						
Brick clay		84,000	40,000	35,000	35,700	38,500
Flint clays		23,000	17,000	--	--	--
Kaolin		27,000	20,000	13,000	-- [r, 3]	--
Diamond[4]	thousand carats	1,795	1,833	1,672	1,367 [3]	1,188 [3]
Gypsum		56,484	140,000	130,000	133,000	144,000
Lime		378,000	340,000	350,000	299,000	283,000
Magnesia, Mg content		57,000 [e]	57,000	57,000	55,000	50,000
Nitrogen, N content of ammonia and urea		500	--	--	-- [3]	-- [3]
Phosphate:						
Phosphate rock, mine output:						
Beneficiated	thousand tons	4,067	4,128	4,110	3,511 [3]	3,476 [3]
P_2O_5 content	do.	1,288	1,310	1,305	1,115 [3]	1,100
Phosphatic fertilizers, P_2O_5 equivalent:						
Monoammonium phosphate		7,600 [e]	7,300	11,000	13,000 [r, 3]	12,500 [3]
Triple superphosphate		165,000 [e]	250,000	115,000	93,700 [r, 3]	108,100 [3]
Phosphoric acid, P_2O_5 equivalent		650,000 [e]	725,000	520,000	560,800 [r, 3]	566,800 [3]
Potassium:						
Potash, K_2O equivalent	thousand tons	1,668	1,702	1,748	1,774 [3]	1,918 [3]
Potassium nitrate	do.	254 [5]	266 [5]	220 [5]	257 [5]	289
Salt, marketed (mainly marine)	do.	874	538	526	537	580
Sand:						
Silica sand		257,000	320,000	300,000	306,000	330,000
Other	thousand tons	9,000	11,000	10,500	10,700	11,500
Stone:						
Crushed	do.	33,000	30,000	29,000	29,600	31,900
Dimension, marble		102,860	94,520	127,880	131,000	141,000
Sulfur:						
Byproduct from petroleum	thousand tons	32	31	38	35 [r, 3]	36 [p]
Sulfuric acid						
Gross weight	do.	1,685	1,814	1,875	1,900 [r, 3]	1,956 [p]
S content	do.	551	593	613	621 [r, 3]	639 [p]

See footnotes at end of table.

TABLE 1--Continued
ISRAEL: PRODUCTION OF MINERAL COMMODITIES [1]

(Metric tons unless otherwise specified)

MINERAL FUELS AND RELATED MATERIALS						
Gas, natural, dry:	thousand cubic meters	11,938	10,739	9,653	9,600 [r]	8,400
Petroleum:						
Oil shale		443,900	449,400	390,000	415,000 [r, 3]	457,900 [3]
Crude	42-gallon barrels	40,800	29,400	25,000	24,000 [r]	28,000
Refinery products:						
Liquified petroleum gas	thousand 42-gallon barrels	3,509	3,755	4,285	4,800 [r]	4,400
Gasoline	do.	17,080	16,834	16,704	19,200 [r]	21,400
Naptha	do.	7,287	7,867	7,915	7,100 [r]	3,800
Kerosene	do.	8,189	8,702	8,850	7,700 [r]	7,400
Distillate fuel oil	do.	15,573	12,927	17,261	18,700 [r]	16,900
Residual fuel oil	do.	9,584	9,740	9,267	8,500 [r]	8,000
Other[e]	do.	5,270	5,360	5,050	5,300 [r]	5,400
Total	do.	66,492	65,185	69,332	71,300 [r]	67,300

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. [p]Preliminary. [r]Revised. -- Zero.

[1]Table includes data available through November 12, 2003.

[2]In addition to the commodities listed, imported gemstones are cut, and secondary refined zinc, such fertilizers as monopotassium phosphate, and a variety of crude construction materials are produced, but available information is inadequate to make estimates of output.

[3]Reported figure.

[4]Imported diamond cut in Israel.

[5]Exports; based on other countries' imports of potassium nitrate from Israel.

TABLE 2
ISRAEL: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Bromine	Dead Sea Bromine Group (DSBG) (Israel Chemicals Ltd. (ICL), 100%)	Sdom	250.
Cement	Nesher Israel Cement Enterprises Ltd.	Ramla	5,000 clinker;
Do.	do.	do.	3,600 cement.
Do.	do.	Haifa	2,000 clinker;
Do.	do.	do.	450 cement.
Do.	do.	Har Tuv	1,000 clinker;
Do.	do.	do.	700 cement.
Lead, refined secondary	Harkunas Lead Works	Ashdod	25.
Magnesium:			
Magnesia	Dead Sea Periclase Ltd. (DSP) (ICL, 100%)	Mishor Rotem	95.
Do.	Tateho Dead Sea Fused Magnesia Co. (DSP, 50%; Tateho Chemical Industries Co. of Japan, 50%)	Mishor Rotem	13.
Magnesium, refined	Dead Sea Magnesium Ltd. (ICL, 65%; Volkswagen AG of Germany, 35%)	Sdom	35.
Petroleum:			
Crude thousand barrels	Lapidoth Israel Oil Prospectors Corp.	Heletz-Brur	22.
Do. do.	do.	Kochav	9.
Refined do.	Oil Refineries Ltd. (Government, 100%)	Haifa	47,500.
Do. do.	do.	Ashdod	32,800.
Phosphate:			
Phosphate rock	Rotem Amfert Negev Ltd. (ICL, 100%)	Arad, Oron, and Zin	5,500.
Phosphatic fertilizers	do.	Rotem	NA
Do.	Haifa Chemicals Ltd.	Haifa	NA
Phosphoric acid[1]	Rotem Amfert Negev Ltd.	Rotem	640.
Do.	Haifa Chemicals Ltd.	Haifa	NA
Potassium:			
Potash	Dead Sea Works (DSW) (ICL, 100%)	Sdom	2,800.
Potassium nitrate	Haifa Chemicals	Haifa	300.
Do.	do.	Mishor Rotem	200.
Salt	Dead Sea Works		700.
Do.	Israel Salt Industries Ltd. (subsidiary of Danker Group)	Atlit, Eilat, and Kalia	NA
Steel:			
Crude	Hod Metals	Akko	200.
Do.	Yehuda Steel Ltd.	Ashdod	150.
Rebar	do.	Gedera	230.
Do.	do.	Ashdod	120.
Do.	do.	Akko	220.
Do.	Hod Metals	Kiryat Gat	100.
Sulfur	Oil Refineries Ltd.	Ashdod	40.
Do.	do.	Haifa	33.
Sulfuric acid	Rotem Amfert Negev	Rotem	NA
Zinc	Numinor Chemical Industries Ltd.	Maalot	NA

NA Not available.

[1] P_2O_5 equivalent.