CHAPTER XI

ELECTRICITY AND MINING

1. Electricity

The value of electricity output rose in 1956 by 10 per cent—from IL.40m. in 1955 to IL.44 million.

The expansion of agricultural production, and the larger scale of domestic and commercial electricity requirements, necessitated higher production. The capacity of the Palestine Electric Corporation remained unchanged in 1955, but increased by 9 per cent during 1956, reaching 250,000 kWh, apart from the capacity of the Jerusalem power plant (9,000 kWh).

The expansion of production capacity was accompanied by a considerable extension of the transmission and distribution network. The length of low-tension cables, which transmit electricity to the consumers, was 3.376 km at the end of 1956—11 per cent more than in 1955. The length of high-tension cables, which conduct electric power over long distances, was 2,804 km in 1956—12 per cent more than in the preceding year. Super-tension cables reached a length of 600 km at the end of 1956, or 22 per cent more than in 1955. The above figures exclude the Jerusalem Electric Corporation, which disposed over an additional 84 km of high-tension cables and 128 km of low-tension cables.

The number of consumers of the Palestine Electric Corporation increased by 9 per cent in 1956; they were for the most domestic and commercial customers. The number of new industrial consumers and the additional use of electricity for irrigation purposes was relatively small.

The output of electricity increased by 7 per cent, from 1,258 million kWh in 1955 to 1,348 million kWh in 1956, and sales of electricity rose by 9 per cent—from 1,049 million kWh to 1,142 million kWh. The fact that consumption increased more than output, was chiefly due to reduced losses in transmission, at the transformer stations and at the power stations. The rate of loss was 16.6 per cent of output in 1954, 16.7 per cent in 1955 and 15.2 per cent in 1956.

Domestic consumers and commercial firms continued to be the most important consumers in 1956. Their requirements accounted for approximately 40 per cent of the total consumption. Industry was next in order of importance, its share increasing from 29 per cent in 1955 to 30 per cent in 1956.

The average price of electricity was 33.4 pruta per kWh in 1956, as compared with 33.2 pruta in 1955. The tariff of industrial and irrigation purposes remained unchanged, but the average price of electricity for domestic and com-

TABLE XI–1

Number of Electricity Consumers, by Type of Consumption, December 1955 and November 1956

Type of consumption	*1955 End of December*	*End of November 1956*	*Change in per cent*	*New connections*
Industrial [a]	11,091	11,389	+2.7	298
Irrigation [a]	1,808	1,907	+5.4	99
Domestic [a]	278,477	304,998	+9.5	26,521
Commercial [a]	42,009	44,665	+6.3	2,656
Total [a]	333,385	362,959	+8.9	29,574
Jerusalem Electric Corp.—all types	34,097	35,858	+5.2	1,761

[a] Excluding the Jerusalem Electric Corporation.
SOURCE: The Palestine Electric Corporation.

TABLE XI–2

Consumption of Electricity by Economic Purpose
(in millions of kWh and per cent)

Purpose	*1955*		*1956*		*Change in 1956 as against 1955 (per cent)*
	millions of kWh	*per cent*	*millions of kWh*	*per cent*	
Industry	301.9	28.8	339.7	29.7	+12.5
Water Supply	83.2	7.9	86.8	7.6	+ 4.3
Irrigation	253.5	24.2	255.5	22.4	+ 0.8
Other	409.7	39.1	460.4	40.3	+12.3
Total	1,048.3	100.0	1,142.4	100.0	+ 9.0

SOURCE: The Palestine Electric Corporation.

mercial consumption rose by about 0.5 per cent, as a result of higher rates introduced towards the end of the year. In recent years, the tariff has not kept pace with the steep rise of fuel prices, wages and depreciation. The income of the Palestine Electric Corporation did not enable it to declare a dividend on its ordinary shares, but it covered expenses. The erection of large production units made for economies as regards fuel and labour costs, overhead expenses per unit of production and losses in the network.

The larger volume of industrial production, the development of industrial branches in which electric power is an important input, the expansion of the irrigation system, the increasing number of consumers—all these called for the extension of existing power stations and the erection of new ones. For security

reasons, the new stations are dispersed geographically, although concentration might have led to lower costs.

According to present plans, output capacity will be increased in 1957 by 20,000 kWh in the Tel Aviv area, and by 50,000 kWh in the South. In 1958, the output capacity in Southern Israel is to be increased by a further 100,000 kWh. The necessary equipment has already been ordered within the framework of the Reparations Agreement.

TABLE XI–3

Average Prices of Electric Current by Economic Purpose 1955 and 1956
(in prutot per kWh)

Year	*Industry*	*Irrigation*	*Domestic consumption*	*Total*
1955	24.6	19.1	49.0	33.2
1956	24.6	19.1	49.3	33.4

SOURCE: The Palestine Electric Corporation.

The investments of the Palestine Electric Corporation between April and December 1956, totalled about IL.49 million—36 per cent more than its real investments in 1955.

These investments were financed from Development Budget funds to the extent of IL.19.0 million, and IL.17.75 million from other sources.

2. MINES AND QUARRIES

The total value of the output of mines and quarries increased by 77 per cent, from IL.2.7 million in 1955 to IL.4.8 million in 1956. In certain plants, production was still in the running-in or experimental stage, and most enterprises were still far from operating at a profit. The companies concerned continued to invest in 1956, with a view to consolidation and expansion, and they endeavoured to prevent the recurrence of past mistakes.

Sales by the three fully-operating firms expanded by 55 per cent, from IL.2,679,000 in 1955 to IL.4,134,000 in 1956. The price of their products underwent no significant changes. The fact that sales increased to a lesser extent than output indicates an expansion of stocks.

The annual average number of workers in the three companies increased by 8.6 per cent, reaching 760 in 1956, as against 700 in 1955. Owing to the reduced rate of development and the simultaneous expansion of current production, a higher proportion of workers was engaged in actual production during the year under review, and relatively fewer were employed in construction jobs. The proportion of administrative and service employees increased. The

total number of persons employed by the five development companies reached 1,000. The working day in development companies was considerably longer than in the manufacturing industries.

Most development companies found it difficult to attract labour, especially skilled labour, although miners were granted wage advantages, tax concessions, the possibility of working long overtime hours, housing facilities and the supply of victuals at reduced prices. The average daily wage in the quarries was IL.10,485 in 1956, among the highest in industry and 12 per cent above the average industrial wage. Wages of quarrymen increased by 19.5 per cent in 1956, while the average increase throughout industry was 14 per cent.

Following the opening of the railway line to Beersheba, the development companies were able to reduce transport costs through the combined use of road and rail haulage facilities. This was particularly important from the point of view of international competition.

Amounts of the investments in mines and quarries made through the various development companies in 1956 are detailed in table XI–4. Table XI–5 includes data of the cumulative investments in mines and quarries up to the end of March 1956, and their sources.

TABLE XI–4

Investments in Mines and Quarries, 1956

(in IL. thousands)

Company	*Total 1955/56*	*1955/56*		*Estimated investments, 1956*
		development budget	*other sources*	
Dead Sea Works, Ltd.	12,670	8,450	4,220	7,350
Israel Mining Industries (Incl. Copper Mines)	4,760	3,800	950	7,860
Negev Phosphates Co. Ltd.	1,230	1,230	—	2,000
Dead Sea Bromide Co. Ltd.	660	660	—	1,340
Negev Ceramic Materials Ltd.	150	150	—	150
Total	19,460	14,290	5,180	18,700

SOURCES: Ministry of Development.

The size of investments required for the exploitation of mineral resources, the risk involved and the delay between the investment and profitable operation, caused investments to be financed primarily from the public purse.

The balance sheets of the five development companies, as at the 31st March, 1956, showed their own funds to account for no more than 11 per cent of their capitalization; long-term loans made up 73 per cent, and short-term loans 16 per cent. The high ratio of long-term borrowing has committed the

TABLE XI–5

Sources of Cumulative Investments in Mines and Quarries, 31.3.1956

(in IL. thousands and per cent)

Company	Own capital	Per cent	Loan capital: long-term	Per cent	Loan capital: short-term	Per cent	Total	Per cent
Dead Sea Works Ltd.	3,660	12	19,990	66	6,500	22	30,150	100
Negev Phosphates Co. Ltd.	1,000	14	5,487	73	963	13	7,450	100
Dead Sea Bromide Co. Ltd.	550	40	655	47	178	13	1,383	100
Negev Ceramic Materials Ltd.	89	33	122	46	57	21	268	100
Israel Mining Industries	225	2	11,980	91	850	7	13,055	100
Total	5,524	11	38,234	73	8,548	16	52,306	100

SOURCE: Companies' Balance Sheets, up to the 31st March, 1956.

development companies to very substantial interest payments, even at a low rate of interest. The resort to short-term borrowing to finance capital expenditure by these companies has also been quite frequent. A revision of the methods of financing the development companies and the reshaping of their capital structure are pre-requisites for improving their financial soundness.

Dead Sea Works Ltd.: The output of the potash plant was considerably increased in 1956, after a delay of several years due to inadequate planning, hesitation in the choice of development methods, lack of experienced personnel and excessive pressure to force the rate of development. According to actual plans, the plant is to produce 135,000 tons of potash a year.

The output of potash in 1956 was 44,300 tons, as compared with 14,000 tons in 1955. Although production was stepped up continuously throughout the year, from 3,000 tons per month on the average in the first half of the year to 5,500 tons per month in the second half, it still attained only about half the projected monthly schedules.

Exports of potash, after the satisfaction of local demand, increased by 28 per cent to 14,900 tons in 1956, as against 11,690 tons in 1955. The installation of a silo in the port of Haifa, with a capacity of 8,000 tons, and the combination of road and rail haulage of potash, helped to reduce transport costs by approximately IL.4 per ton.

Investments in the potash company in 1956 totalled IL.7.4 million, in addition to a total amount of IL.33.5 million which had been invested in the plant in the years 1952–55. Considerable investments are still necessary to ensure regular and efficient production.

The flotation method of potash processing introduced in the year under review resulted in a considerable saving of raw materials. The problem of the large labour turnover in the company's plants at Sdom was being attended to

at the end of 1956. Most employees used to regard Sdom as a temporary place of work, in which they would stay until they had saved a certain amount of money and then return north. A permanent housing scheme at Dimona for the employees of Dead Sea Works Ltd., and adequate transport facilities between the two places are likely to attract a permanent labour force. This arrangement may also be expected to reduce the number of overtime hours worked at the plant, which are expensive and little productive.

Dead Sea Bromide Co., Ltd.: The Dead Sea Bromide Company was founded in 1954 as a subsidiary of Dead Sea Works Ltd. According to plan, regular production should start in 1957. Altogether, IL.2 million had been invested in the bromide plant by the end of 1956, of which IL.1.3 million were invested in 1956, when the erection of two plants, with a joint output capacity of 1,250 tons of bromide per annum, was completed. Total planned annual production is 2,000 tons of bromide, of which 1,400 tons will be processed into ethylene di-bromide, an insecticide. The raw material for the production of bromide is a residual solution obtained during the production of potash, and containing a higher percentage of bromide than is contained in sea water (from which bromide is extracted in most other countries). The bromide company's output is intended mainly for export. The company is still engaged in market research, and endeavours to overcome certain difficulties due to the existence of an international cartel of bromide producers.

Negev Phosphates Ltd.: The output of phosphates increased by 60 per cent to 117,500 tons in 1956, as compared with 73,500 tons in 1955. The monthly average number of workers employed by the company was 230—23 per cent more than in 1955.

The value of phosphate sales in 1956 was IL.2.3 million, i.e. 84 per cent more than in 1955. Of this, exports accounted for IL.575,000, the remainder being sold to Fertilizers and Chemicals Ltd. for the manufacture of superphosphates. The average phosphorous content of quarried rock was 28.5 per cent in 1956.

Despite the increased volume of output and the reduction of costs through mechanization, the company's income was sufficient only to cover current expenditure, exclusive of amortization and interest payments.

Negev Ceramic Materials Ltd.: In 1956, Negev Ceramic Materials Ltd. produced 14,500 tons of glass sand, as compared with 12,600 tons in 1955, and 7,000 tons of clay, as against 8,500 tons in 1955. Production costs were reduced in the year under review through mechanization of the quarries. The year ended with a profit. Negev Ceramic Materials Ltd. supplies 95 per cent of the sand required by the glass industry, 90 per cent of the clay used for the manufacture of chamotte bricks and 80 per cent of the clay used by the

ceramic industry. The considerable deposits of clay in the Makhtesh Hathira (Great Crater), and the Makhtesh Ramon are suitable for the production of heavy ceramics and sanitary ware, but not of fine ceramics or porcelain. The topographic situation of the clay deposits in both craters is unfavourable; prospecting for new deposits is in progress.

Israel Mining Industries; the Copper Plant: The activities of Israel Mining Industries in 1956 concentrated on the erection of the copper plant at Timna, which, according to existing plans, should produce 7,000 tons of metallic copper per annum. About IL.6.5 million were invested in the copper plant in 1956, total investment in this project by the end of the year amounted to IL.10 million, or 63 per cent of the projected investment (IL.16 million). About 60 per cent of the construction was completed by the end of 1956, and 90 per cent of the equipment ordered for the plant arrived.

Israel Mining Industries continued to explore the extent of iron ore deposits in the Mount Tabor area. At present, the feasibility of commercial exploitation is still doubtful. The company also continued to map the iron ore deposits at Ramim and found them suitable for exploitation. They will provide the raw material for the smelting plant in the Acre Steel Town.

Israel Mining Industries continued to carry out geological surveys, in search of feldspar and granite deposits. Research to establish the possibility of electric power generation through the direct combustion of bituminous limestone was successfully completed in 1956. Bituminous limestone is abundant at Ein Bokek.

3. Oil

There were nine oil-producing wells in the Heletz field at the end of 1956, compared with a single one at the beginning of the year. The average output per well was 100 barrels per day, and the total annual output was 200,000 barrels (about 27,400 tons). The price of a barrel of oil on the Mediterranean sea coast is about $2.50. The value of Israel's oil output in 1956 was therefore about $500,000. The foreign currency saved through local oil production is estimated at about 40 per cent of total value. However, local wells supplied less than 2 per cent of Israel's oil requirements (about 1,600,000 tons per annum).

The number of drillings in the Heletz field was 23 in March, 1957. Oil-bearing strata were struck in seven places, up to April 1957, apart from the nine producing wells. The exploitation of these new wells will be started in 1957. Five additional wells are now being drilled. Until now, two of the borings made in the Heletz field were found to be dry.

Local workers were being trained for oil-drilling and exploitation in 1956, and at present the work is being conducted almost without the participation of foreign experts.

The transport of the oil by pipeline and rail via Ascalon to Haifa, reduced

transport costs to the refinery by half—from nearly IL.7 per ton (road haulage) to less than IL.4 per ton (rail).

The total current expenditure in the Heletz oilfield until April 1957 was about IL.6.5 million, including depreciation of equipment, purchased at a cost of $3.6 million, but excluding the investment itself.

Altogether, 13 test drillings, including the Heletz exploration, were made in 1956 (as compared with 10 drillings in 1955) by three foreign and two Israel companies. Foreign oil prospecting companies ceased their activities during the period of the Sinai operations and part of their equipment was hired by local companies.

Between 1954, when oil prospecting has begun in this country, and until the end of 1956, foreign and local prospectors incurred an expenditure of IL.19.9 million and $10.8 million, of which IL.15.5 million and $3.8 million were spent in 1956—as detailed in table XI–6.

Despite some encouraging signs, oil drillings outside the Heletz area have not yet yielded positive results. The proved reserves of the Heletz oilfield are relatively small. They have been estimated at about 10 million barrels, and their value at $25 million. According to this estimate, there would be room for 20 to 24 wells, in the Heletz field, each producing 100 barrels per day, or a total of about 2,000 barrels, assuming that an average of two or three wells will be stopped for maintenance. At this rate of production, the Heletz field would be able to supply about 6 per cent of the country's present annual fuel requirements, for a period of 14 years. The number of producing wells in the Heletz area is expected to increase to 17–20 in the course of 1957 and daily production figures to reach 1,700 barrels.

TABLE XI–6

Expenditure of Oil Companies in 1956

(in IL. millions)

Purchases of Machinery and Equipment Abroad	7.2
Other Expenditure Abroad	1.4
Purchases of Equipment in Israel	3.0
Current Expenditure in Israel	8.5
Total	20.1

SOURCE: Ministry of Development.

Apart from the proved oil reserves mentioned above, there are potential reserves, of which the commercial possibilities depend on either of the following factors: (a) experiments to produce oil from hard calcareous sandstone; (b) the striking of oil-bearing strata at a greater depth than the stratum now exploited; (c) the discovery of new extensions of the Heletz field.

Construction was begun at the end of 1956 of an 8-inch oil pipeline covering the distance of 244 km from Eilat to the Beersheba railway station. More than 1,000 man-days were required for nearly six months to lay this line, which thus proved an important source of employment in the southern part of the country. Most of the pipes were manufactured by the pipe factory at Sarafand. Immediately upon completion of the line, in April 1957, oil began to be pumped to Beersheba, from where it was transported by rail to the Haifa refineries. The annual throughput of the pipeline is about 720,000 tons of oil—approximately half of the country's present annual fuel consumption. The investment in the pipeline totalled about IL.12 million and was financed from the Development Budget.

At the beginning of 1957, work commenced on the laying of a 16-inch pipeline from Beersheba to Ashdod Yam, the port from which oil will be in future carried by sea to the Haifa refineries. Oil from the Heletz field is also to be pumped through this line, which will be completed in the course of 1957, at an estimated cost of IL.7 million.

The use of the Eilat-Ashdod Yam pipeline will permit considerable economies in transport costs in comparison with the cost of shipping oil from the Persian Gulf to Haifa via the Cape of Good Hope. The cost of transporting a ton of oil from Eilat to Haifa is estimated at $4.80. The saved expenditure will depend on international tanker rates, which have been subject to sharp fluctuations, but it should amount to at least $1.40 per ton, and—should freight charges rise—may total as much as $7.00 per ton. Even if the Suez Canal is opened to ships with cargo to Israel, the pipeline will still save about 50 cents per ton, providing the fuel is shipped to Eilat in tankers of over 35,000 tons, which cannot pass through the Canal.

Plans were also completed during 1956 for a 6-inch pipeline from Haifa to Tel Aviv, intended to carry refined oil[1] from the Haifa Refineries to the southern part of the country. The laying of this 87 km line began in February 1957, and is to be completed towards the end of the year. At first, it will be able to carry 350,000 tons of fuel per annum. In a second stage, its capacity will be increased to 500,000 tons. The consumption of refined fuel in the southern part of the country in 1956 was assessed at 300,000 tons. The investment in the pipeline is estimated at IL.2.4 million, of which $500,000 is in foreign currency. The Government will finance the construction from the Development Budget.

[1] Benzine, kerosene and solar.