

**SECRET**

**Nº 38**

**ECONOMIC INTELLIGENCE REPORT**

**THE CEMENT INDUSTRY  
IN THE EUROPEAN SATELLITES  
1950-60**



CIA/RR 59-19

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**CENTRAL INTELLIGENCE AGENCY**

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THE CEMENT INDUSTRY IN THE EUROPEAN SATELLITES\*  
1950-60

Summary

Production of cement in the European Satellites increased considerably during 1950-58 and is expected to increase at an even greater rate during 1959-60. In spite of this increase in production and an expected decline from the high level of Satellite exports of cement, the Satellites still will be unable to meet the increasing demand for this basic construction material. During 1959-60, increases in production of cement have been planned to meet the expanded demand, particularly for housing, but, even with substantial increases in the availability of cement, past failures to fulfill planned goals suggest that some underfulfillment of current plans will continue and that the supply of cement will remain a limitation on the construction program.

Primarily because of output obtained from new plants, production of cement in the European Satellites in 1958 increased 112 percent above the level of 1950 to 17.7 million metric tons\*\* annually. Although the rate of increase in production of cement during 1950-58 was greater than that in the US, it was less than that in the USSR, and the Satellites still produced only about one-half as much cement as the USSR and one-third as much as the US. During 1950-56 the individual Satellites generally failed to fulfill production plans because of the tendency to formulate unrealistic goals, the failure to introduce new plants and capacities on schedule, and inadequate maintenance of existing facilities. In 1957 and 1958, however, more realistic planning was evident, and most of the countries fulfilled their annual production plans.

In 1957, consumption of cement in the European Satellites increased 23 percent above the level of 1956 because of the growth in production and the reduction by one-half of net exports in 1957 compared with 1956.\*\*\* Net exports for 1957 amounted to 9 percent of production, whereas net exports during 1950-57 had averaged 15 percent of production. The significant decrease in net exports in 1957 reflects a basic change in the policy

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\* The estimates and conclusions in this report represent the best judgment of this Office as of 15 April 1959.

\*\* Tonnages are given in metric tons throughout this report.

\*\*\* For estimated production of cement in the European Satellites, 1950-58, and net exports and consumption, 1950-57, see the chart, following p. 2.

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of the Soviet and Satellite regimes. In that year the USSR decreased its demands on the Satellites for cement, permitting the Satellites to increase their housing construction programs.

During 1951-57 the index of the volume of construction in the European Satellites (reportedly measured in constant prices) generally increased faster than that of consumption of cement (measured in tons). This trend is counter to that in the US and the USSR and, combined with the increasing use of precast concrete as a building material in the Satellites, suggests that the indexes of the volume of construction in the Satellites are inflated.

Production is planned to increase to 23 million tons in 1960, at an average annual rate of 14.0 percent during 1959-60 compared with a 9.8-percent rate achieved during 1951-58. Past difficulties in completing new plants on schedule, however, coupled with the overambitious long-term plans for 1960, suggest that a number of the production goals of the European Satellites will not be fulfilled, so that an average annual rate of 10.7 percent and an over-all plan fulfillment of 94 to 95 percent are estimated. With only a small increase in exports above the 1957 level expected in 1960, somewhat more than 20 million tons of cement will be available for domestic use in the European Satellites in that year. This amount will permit considerable expansion in construction, but the supply of cement still will be short of the demand.

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I. Supply of Cement.

A. Production and Plan Fulfillment.

The annual production of cement in the European Satellites has increased 112 percent, from 8.4 million tons in 1950 to 17.7 million tons in 1958 (see Table 1\*). Although this increase was considerably less than that achieved in the USSR in the same period (almost 230 percent), it was significantly higher than that achieved in the US (slightly more than 40 percent).

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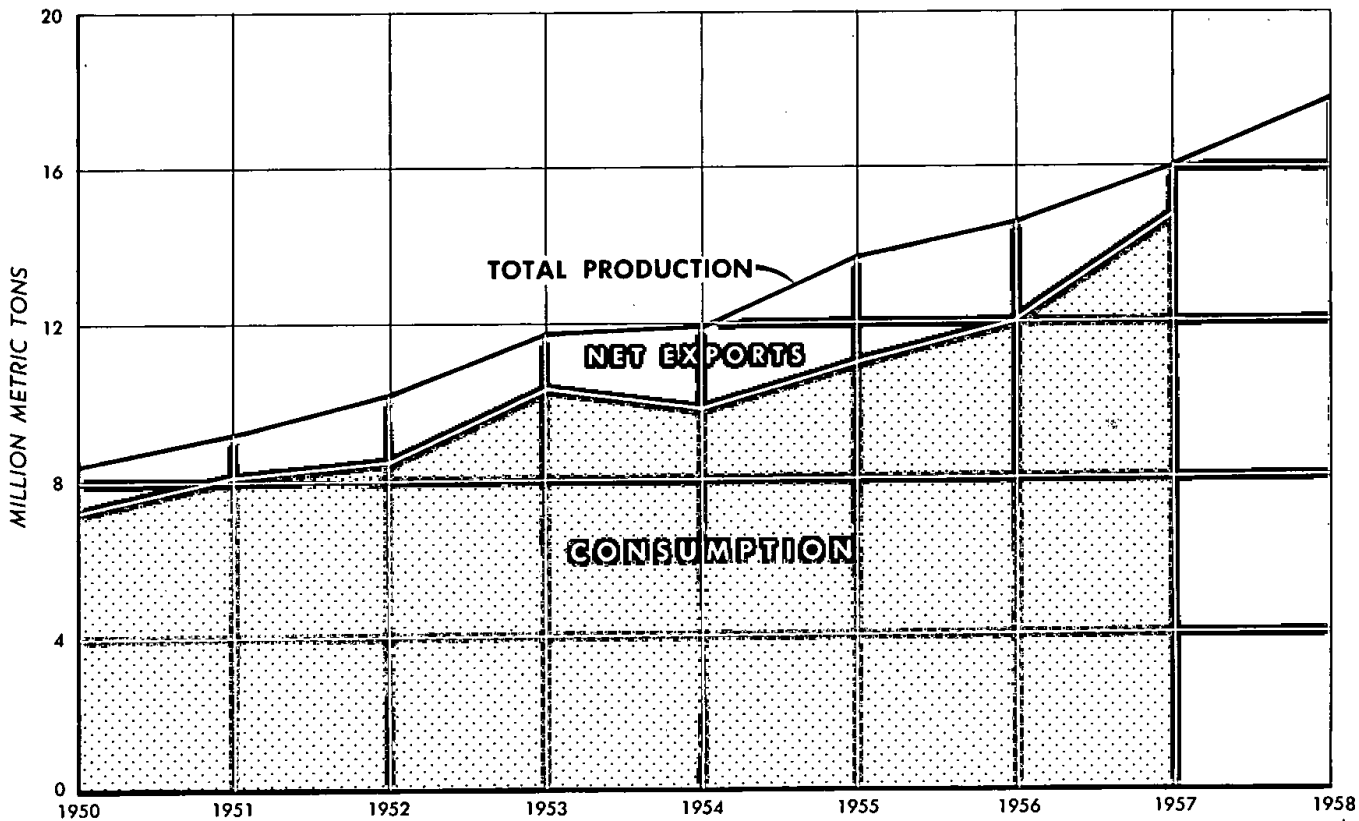
\* Table 1 follows on p. 3.

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**ESTIMATED PRODUCTION OF CEMENT  
IN THE EUROPEAN SATELLITES, 1950-58,  
AND NET EXPORTS, AND CONSUMPTION, 1950-57**



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Table 1  
Estimated Production of Cement in the European Satellites  
1950-60

Country	Thousand Metric Tons										
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Albania <u>a/</u>	15	18	19	13	15	45	65	70	78	80	85
Bulgaria <u>b/</u>	602	627	672	701	780	812	859	880	934	1,200	1,350
Czechoslovakia <u>c/</u>	1,998	2,064	2,209	2,320	2,562	2,892	3,148	3,672	4,100	4,300	4,600
East Germany <u>d/</u>	1,412	1,656	2,023	2,448	2,635	2,971	3,269	3,460	3,558	4,200	4,900
Hungary <u>e/</u>	797	948	1,057	1,060	947	1,175	995	989	1,302	1,390	1,450
Poland <u>f/</u>	2,514	2,695	2,652	3,294	3,455	3,813	4,035	4,487	5,041	5,300	6,100
Rumania <u>g/</u>	1,028	1,148	1,514	1,906	1,518	1,991	2,186	2,421	2,687	2,900	3,200
Total	<u>8,366</u>	<u>9,156</u>	<u>10,146</u>	<u>11,742</u>	<u>11,912</u>	<u>13,699</u>	<u>14,557</u>	<u>15,979</u>	<u>17,700</u>	<u>19,370</u>	<u>21,685</u>
Index of total (1950 = 100)	100	109	121	140	142	164	174	191	212	232	259

a. 1950-52, 3/; 1953-56, 4/; 1957, 5/; 1958, 6/; 1959-60, based on the estimated underfulfillment of the 1960 plan: 7/

b. 1950-57, 8/; 1958, 9/. No plan for 1960 has been announced. Production in 1959 and 1960, therefore, is estimated on the basis of past performance and expected new plant completions.

c. 1950-57, 10/; 1958, 11/; 1959-60, estimated on basis of past performance and the 1960 plan. 12/

d. 1950-56, 13/; 1957, 14/; 1958, 15/; 1960, based on the same percentage fulfillment of the 1960 plan as was achieved in 1958 (95 percent) 16/; 1959, based on an annual rate of increase of 17.3 percent between the figures for 1958 and 1960.

e. 1950-55, 17/; 1956-57, 18/; 1958, 19/. Plans for 1959-60 are revised, and it is estimated that they will be fulfilled. 20/

f. 1950-52, 21/; 1953-54, 22/; 1955-57, 23/; 1958, 24/; 1959-60, estimated on the basis of underfulfillment of the 1960 plan. 25/

g. 1950-57, 26/; 1958, 27/; 1959-60, estimated on the basis of the underfulfillment of the 1960 plan. 28/

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The average annual rate of growth in production of cement in the European Satellites was 9.8 percent between 1950 and 1958, but this growth was uneven over the years. The highest increase occurred in 1953, with production at 15.7 percent above the 1952 level, when new plants in both Rumania and Poland began producing and considerable new capacity was added to existing plants in East Germany. In 1954, however, production increased by only 1.4 percent, as Hungarian and Rumanian production decreased by one-half million tons largely because of the excessive downtime of kilns at a number of plants. In addition, the average annual rates of increase between 1950 and 1958 among the individual countries have varied considerably. These rates of increase, along with the share of the total Satellite production in each country in 1958, are indicated below (in percent):

<u>Country</u>	<u>Average Rate of Increase 1951-58</u>	<u>Share of Total Satellite Production of Cement in 1958</u>
Poland	9.1	28.5
Czechoslovakia	9.4	23.2
East Germany	12.2	20.1
Rumania	12.8	15.2
Hungary	6.3	7.3
Bulgaria	5.6	5.3
Albania	22.9	0.4
Total		<u>100.0</u>

The extremely high rate of increase in Albania is the result of the completion of a second plant which has more than twice the capacity of the only plant existing in 1950. The low rates in Hungary and Bulgaria resulted from the limited investment in the cement industries of the two countries. In both, only one plant was expanded and one new plant completed. The new Hungarian plant had considerable difficulty in production, and the Bulgarian plant was not completed until December 1958.

In spite of the significant increases in production during 1951-58, the individual Satellites have generally failed to fulfill annual production plans, and, in particular, long-term plans have been underfulfilled, although recently annual plan fulfillment was improved. Out of a total of 42 annual and long-term plans which are known,\* only 16 were fulfilled or overfulfilled, and only 3 out of 7 plans which were revised were fulfilled.

\* This total includes the plans for 1950-58 for the three largest producers: Poland, Czechoslovakia, and East Germany.

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The eight long-term plans which terminated during the period (generally 5-year plans) were fulfilled in only East Germany and Bulgaria.\* The primary reason for the failure to fulfill production plans was that these plans were unrealistic. This situation was particularly true in the less industrialized countries (Albania, Bulgaria, Rumania, and Hungary), where persons skilled and experienced in planning and plant operations were not available. In addition, even in the more industrialized countries the plans were generally politically inspired rather than economically justified. For example, in Poland the Central Office of the Cement Industry submitted production plans to the Ministry of Light Industry based on a plant operating rate of 79 percent. The Ministry, however, revised the plan upward, basing the annual plans on an operating rate of from 85 to 88 percent. The degree of fulfillment of the plans indicates that actual operating rates were very close to 79 percent. <sup>29/</sup> In addition, Polish, Bulgarian, and Rumanian plans were inflated because the USSR was prodding these countries into establishing higher goals so that the Soviet demand for a high level of imports from these countries could be satisfied. Other reasons for the failure to produce at planned levels were the failure to complete new capacities on schedule; to achieve a satisfactory degree of utilization of the new capacity within a reasonable length of time; and to allow sufficient time for preventive maintenance, which resulted in frequent breakdowns and accelerated wear on equipment.

Plan fulfillment improved in 1957, and the improvement continued in 1958. In 1957, production of cement increased by 9.8 percent above the level of 1956, and the annual plans were fulfilled in at least four countries, although Hungary and Bulgaria had revised the original plans downward. Again in 1958, plans were fulfilled in at least four countries, as production increased by 10.8 percent above the level of 1957. The success in fulfilling the plans and the downward revisions suggest that, beginning in 1957, the European Satellites had begun adopting more realistic annual plans. This change was facilitated by decreased pressure from the USSR for exports of cement from the Satellites and a lessening of Soviet control, as well as improved planning capabilities in the Satellite governments together with a more realistic approach to planning future production.

B. Quality and Labor Productivity.

The quality of cement is designated in the Bloc countries by a "mark," or grade number. This number indicates the average 28-day

\* Another Bulgarian 5-year plan which terminated in 1957 was underfulfilled.

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compressive strength of the cement (in kilograms per square centimeter) combined with a suitable aggregate and water under certain prescribed testing conditions. All the Bloc countries produce several grades of the different types of cement.\* The average quality of cement produced (as measured by the average complex of grades in any country) is very important, as the quantity of cement required to make concrete of a given strength varies with the quality used -- that is, less high-grade cement is required to produce a desired quality of concrete.\*\* The average quality of cement produced in the European Satellites is estimated to have been slightly above that of the USSR in 1958.\*\*\* Because of the extensive net exports of the better grades of cement from the Satellites,\*\*\*\* however, the average quality of cement available for domestic consumption was somewhat lower than the average quality produced, whereas in the USSR exports are negligible, so that the quality of cement consumed is assumed to be about the same as the average quality produced. It is probable, therefore, that there is little difference in the amount of cement required to produce a given quality of concrete in the USSR and in the Satellites.

More than half of the cement produced in the European Satellites is of a portland type. It is estimated that 50 to 60 percent of the total production is of this type, that 30 to 40 percent is portland slag or slag cement,† and that 5 to 10 percent is of special-purpose types. The use of slag in the manufacture of cement is most widespread in East Germany and Czechoslovakia, and Poland plans to expand considerably the use of slag in the future. Largely because of the increasing use of slag, which tends to lower the average quality of cement, it is unlikely that any significant rise will be achieved in the average grade of cement produced during the next several years.

\* In the US, each type of cement has a single standard, and all cement of any given type must adhere to the appropriate standard.

\*\* There are a number of other very important determinants of the quality of concrete -- for example, the water-cement ratio and the quality and proportions of the aggregates, but these are assumed to be constant.

\*\*\* Because of different testing methods, however, Soviet cement has a grade number which is about 50 percent higher than that of the comparable quality of Satellite cement.

\*\*\*\* Nearly all the Satellites are known to produce some high-grade cements for export which conform to foreign standards (usually UK or US). For example, during 1955-57 an average of 7 percent of Czechoslovak production of cement conformed to the standards of Western countries. 30/

† The percentage of slag in these cements varies from less than 5 percent to more than 95 percent and probably averages somewhat above 50 percent.

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This increasing utilization of slag is expected, however, to result in a lowering of the costs of production\* and an increase in the productivity of labor, which in 1957 was approximately 500 tons per worker per year based on an estimated labor force of between 30,000 and 35,000 workers. Labor productivity in the cement industry of the European Satellites was therefore approximately 85 to 90 percent of Soviet productivity in 1957, approximately three-fifths of Western European productivity, and less than one-quarter of US productivity. In 1958, labor productivity is estimated to have increased in the Satellites by at least 5 percent, or to about 520 to 540 tons per worker per year.\*\* Although substantial gains in Satellite labor productivity are probable in the future, it is doubtful that the gap between productivity in the Satellites and in the above countries will be significantly narrowed.

## II. Consumption of Cement.

### A. Consumption and Construction.

Cement is a basic input in almost all modern construction, but it must be combined with an aggregate (such as sand, gravel, or crushed stone) to become a usable building material. Most of it is used to make concrete, but a small percentage of the total cement consumed goes into masonry cement (mortar) or asbestos-cement products. In the European Satellites, consumption\*\*\* of cement doubled in 1957 compared with 1950,

\* Slag requires little handling or processing and is therefore less costly to produce than portland clinker. For example, in Poland in 1955 it was calculated that the cost of portland slag cement was between 72 and 91 percent of that of portland cement. 31/

\*\* Among the several Satellites, output ranged from about 200 to about 800 tons per worker, with Albania, Hungary, and Rumania having the lowest productivity and Czechoslovakia and East Germany the highest. The extensive use of slag in the latter two countries is an important factor in the higher productivity.

\*\*\* The term consumption used in this report actually is apparent consumption, which is the sum of production and imports, minus exports, and does not take account of changes in stocks. These changes in stocks are very slight, however, because of the limited storage facilities in the Satellites and the bulkiness and semiperishable nature of cement which make stockpiling impractical. In Hungary, for example, the average annual difference between actual and apparent consumption of cement during 1951-55 was 2.8 percent, and stocks were augmented and decreased in alternate years. 32/

The discussion of consumption and trade in this report is limited to 1957 because this is the last year for which information is available. However, the trends as established in 1957 are not believed to have been significantly changed during 1958.

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but in five of the Satellites the index of the volume of construction (reportedly measured in constant prices) increased slightly more rapidly than the index of consumption of cement (measured in the physical quantity of cement) (see Table 2\*). In both the US and the USSR the index of consumption of cement has increased at a higher rate than the index of the volume of construction because of the increasing utilization of concrete in construction and specifically in the USSR because of the increasing proportion of cement used in concrete. The most dynamic element in the increasing use of concrete in the USSR is the emphasis being placed on the precast concrete components program.\*\* The European Satellites, in imitation of the Soviet program, also have been radically increasing the use of precast concrete. The indications point to a more rapid increase in the index of consumption of cement than in the index of the volume of construction in the Satellites and therefore suggest that the indexes of the volume of construction in the individual Satellites actually reflect a degree of inflation beyond the increase in the physical volume of construction.

Consumption of cement in the European Satellites, like production, increased at about the same rate from 1951 through 1954, but, because of the large increase in exports, dropped below the rate of increase of production in 1955-56. In 1957, consumption of cement increased by 23 percent above the 1956 level, and production of cement increased by 10 percent. The significant increase in consumption in 1957 occurred partially as a result of the halving of net exports in that year compared with the 1956 level. The higher level of consumption in 1957 reflects a basic change in the policy of the Soviet and Satellite regimes. In that year the USSR decreased its demands on the Satellites for cement imports,\*\*\* permitting greater freedom for the Satellite regimes to fulfill nonindustrial domestic demand.

In line with the greater Soviet emphasis in 1957 on increased living standards and increased housing, the European Satellites accelerated state housing programs and allocated higher priority to private housing. This trend is reflected in the increased allocations of cement not only to state housing but also to the private sectors and in the decreased prices for cement in private sectors. For example, in Hungary, consumption of cement in the private sector increased from 18,000 tons

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\* Table 2 follows on p. 9. In East Germany the index of consumption increased slightly faster than the index of construction, and in Hungary the fluctuations in both were so great that no trend is discernible.

\*\* Precast concrete is poured into forms and cured in some central location and is then lifted into its permanent position. Precast components include stairways, walls, and reinforced structural components.

\*\*\* For a more complete discussion of trade, see B, p. 10, below.

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Table 2

Estimated Consumption of Cement in the European Satellites  
1950-57

Country	Thousand Metric Tons							
	1950	1951	1952	1953	1954	1955	1956	1957
Albania a/	75	78	79	73	65	85	80	90
Bulgaria a/	424	447	478	519	613	653	631	689
Czechoslovakia b/	1,998	2,064	2,209	2,312	2,461	2,901	2,991	3,632
East Germany a/	1,221	1,456	1,448	1,979	2,032	2,286	2,699	3,261
Hungary a/	798	1,012	1,055	1,057	757	883	815	980
Poland c/	2,152	2,310	2,421	2,930	3,068	3,236	3,614	4,539
Rumania a/	513	648	764	1,406	768	891	1,086	1,421
Total	<u>7,181</u>	<u>8,015</u>	<u>8,454</u>	<u>10,276</u>	<u>9,764</u>	<u>10,935</u>	<u>11,916</u>	<u>14,612</u>
Index of total (1950 = 100)	100	112	118	143	136	152	166	203

a. Difference between production and net trade figures (see Table 1, p. 3, above, and Table 3, p. 11, below).

b. 1950, 1952-57, 33/; 1951 (see footnote a, above).

c. 1950-51 (see footnote a, above); 1952-54, 34/; 1955-57 (see footnote a, above).



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in 1953 to 212,600 tons in 1957, and in Czechoslovakia, where consumption in the private sector increased from 90,000 to 360,000 tons in the same years, the retail price of cement to the private sector declined from 5,000 crowns\* per ton in 1952 to 520 crowns per ton in December 1956. <sup>35/</sup> Prices to the private sector, however, remained considerably above those to the state sector,\*\* as in the case of Hungary, where in 1957 the average price to the private sector was 5.7 times greater than that to the state sector, and in the case of Poland, where in 1957 it was 3.3 times as high.

With the large increase in consumption in 1957 above the level of 1956 and with the doubling of consumption compared with 1950, the per capita consumption of cement in the European Satellites in 1957 was 90 percent above the 1950 level, compared with an increase of 68 percent in Western Europe. Yet in 1957 per capita consumption in Western Europe was 249 kilograms (kg), and in the Satellites it was only 152 kg.\*\*\*

#### B. Foreign Trade.

The European Satellites as a group were large net exporters of cement during 1950-56, but in 1957 exports decreased substantially (see Table 3\*\*\*\*). From 1950 through 1957, net annual exports from the Satellites as a group averaged 15 percent of the total annual production, with the highest percentage of annual production (20 percent) exported in 1955. During the same period, net annual exports from Western Europe averaged 8 percent of production, with a high of 11 percent in both 1951 and 1952. The USSR has been the principal importer of Satellite cement during the period, taking 36 percent of net Satellite exports during 1955-57† and a higher percentage in the earlier years.

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\* Crown (koruna) values are expressed in current crowns and may be converted to US dollars at the official rate of exchange of 7.2 crowns to US \$1. This rate of exchange, however, does not necessarily reflect the true dollar value.

\*\* Prices to the state sector in the Satellites are usually sufficient to cover the costs of production. Export prices, however, are determined both by bargaining with the customer and by the level of world prices and frequently have been below the costs of production in the exporting country.

\*\*\* See Appendix A, Table 4, p. 16, below.

\*\*\*\* Table 3 follows on p. 11. Albania has been the only exception, with net annual imports fluctuating between an estimated 15,000 and 60,000 tons during the period.

† Derived from Table 5, Appendix A, p. 17, below.

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Table 3

Estimated Net Foreign Trade in Cement of the European Satellites a/  
1950-57

Country	Thousand Metric Tons							
	1950	1951	1952	1953	1954	1955	1956	1957
Albania b/	+60	+60	+60	+60	+50	+40	+15	+20
Bulgaria c/	-178	-180	-194	-182	-167	-159	-228	-191
Czechoslovakia d/	Negl.	Negl.	Negl.	-8	-101	+9	-157	-40
East Germany e/	-191	-200	-575	-469	-603	-685	-570	-199
Hungary f/	+1	+64	-2	-3	-190	-292	-180	-9
Poland g/	-362	-385	-231	-364	-387	-577	-421	+52
Rumania	-515	-500	-750	-500	-750	-1,100	-1,100	-1,000
Total net exports d/	-1,185	-1,141	-1,692	-1,466	-2,148	-2,764	-2,641	-1,367
Index of total net exports (1950 = 100)	100	96	143	124	181	233	223	115
Total net exports as a percentage of production	14	12	17	12	18	20	18	9

a. Net imports (+); net exports (-).

b. 1950-51, estimated to have been the same as in 1952-53; 1952-57, estimated on the basis of numerous fragmentary reports.

c. 1950-51 and 1953-57 exports, 36/. Imports from the USSR in 1955-56 were deducted (see Appendix A, Table 5, p. 17, below). Very small imports of special types of cement probably were received from the USSR also during 1950-54. This is the only country from which Bulgaria is believed to import cement. 1952, estimated to be in the range between the 1951 and 1953 figures.

d. 1950-53, net balance of trade appeared to be negligible. 1954-57, difference between production and consumption (see Table 1, p. 3, above, and Table 2, p. 9, above).

e. 1950, 37/; 1951-57, 38/. These figures represent exports only. Imports during the period are believed to be negligible.

f. 1950-55, 39/; 1956-57, 40/.

g. 1950-51 imports, 41/; 1950-51 exports, 42/; 1952-54 imports and exports (see footnote d, above); 1955-56 imports and exports, 43/; 1957 imports, 44/; 1957 exports, 45/.

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In 1955 and 1956, net annual exports of cement from the European Satellites were 133 percent and 123 percent, respectively, above the 1950 level. These increases resulted primarily from a significant increase in exports to non-Bloc countries (mostly the countries of the Near and Far East). For example, Rumanian exports outside the Bloc were 38,000 tons in 1953 and 183,000 tons in 1954 and rose to 542,000 tons in 1955.\* 46/ A significant downward trend occurred in 1957, however, when net exports were almost halved in comparison with 1956 and accounted for only 9 percent of total production. Poland became a net importer of cement for the first time since World War II, while net exports from East Germany and Hungary dropped significantly.\*\* The change in 1957 resulted from the easing of Soviet pressure on the Satellites for exports to the USSR and other countries, an attempt by the Satellite regimes to satisfy more fully domestic demand for housing,\*\*\* and the greater difficulty in exporting to the underdeveloped countries which are becoming increasingly capable of supplying their own needs. The causes for the lower level of exports are not expected to diminish in the near future, and, therefore, the level of exports by the Satellites will not increase substantially above the 1957 level in the next several years,\*\*\*\* although Rumanian and Bulgarian exports probably will continue to increase gradually because the industry in these countries has been developed partially for export trade.

### III. Investment and Expansion.

The expansion of production in the cement industry entails a considerable outlay of capital investment, as it has one of the highest

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\* In every year (1950-57), Rumania has been the largest net exporter of cement in the European Satellites. In 1955, estimated net exports from Rumania equaled 55 percent of production, and about 50 percent in 4 other years. Cement is one of the few commodities (other than timber and petroleum products) which Rumania produces in sufficient quantity to export and for which markets can be found. The cement industry is an old industry in Rumania (a number of plants were operating before World War II). The country is capable of manufacturing the equipment necessary for cement manufacture and is even exporting plants to all the Far Eastern Communist countries as well as India and Indonesia.

\*\* The drop in Hungarian exports was largely due to the disruption in production as a result of the uprising. In addition, from November 1956 to March 1957, almost 39,000 tons of cement were received as aid from other Communist countries. 47/

\*\*\* The use of precast concrete particularly for multiple-unit dwellings is increasing in the Satellites, thus requiring more cement per unit.

\*\*\*\* Polish exports of cement in the first half of 1958 were only 45,000 tons, which was 62 percent of exports in the first half of 1957. 48/

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costs of capital investment in relation to the total output costs of any industry and receives a major share of investment funds for the construction materials industry. In Czechoslovakia, 46 percent of the investment funds allotted to the whole construction materials industry during 1954-56 were utilized by the cement industry. Most of the funds allotted to the expansion of the cement industry in the European Satellites are expended on construction of new plants, and the primary source of the substantial increase in production during 1951-58 was the output obtained from new plants completed during the period. For example, 61 percent of the increase in production in Poland during 1951-55 came from new plants, almost 80 percent of the investment funds expended on the cement industry in Czechoslovakia during 1951-56 were allocated for construction of new plants, and 10 out of 16 new kilns completed in Rumania during 1951-58 were installed at new plants.

Emphasis on construction of new plants occurred in spite of a relatively low average output per plant of 242,000 tons in 1958,\* which was about three-fifths of the average Soviet output per plant in 1958. In addition, the investment costs of adding capacity by constructing new plants are higher than the costs of expanding existing plants. For example, in Poland the cost of building new plants is expected to average 67 percent more per ton of added capacity than the cost of expanding existing plants. The higher investment costs, however, generally tend to be more than compensated for by lower transportation and operating costs at new plants.

Because construction of new plants accounted for the major source of increased production during 1950-58, the usual failure to complete new plants on schedule and the extended time necessary to attain optimum utilization of the facilities have been a serious deterrent to production plan fulfillment. For example, in Czechoslovakia, construction of a cement plant has taken as long as 8 years; in Bulgaria a plant scheduled for operation at the end of 1956 began trial operation at the end of December 1958; and in Hungary a new plant completed in 1952 produced only 53 percent of its planned production in 1954.

#### IV. Prospects.

The cement industry of the European Satellites is expected to expand considerably in the future, as an attempt is to be made to satisfy more adequately the increasing domestic demand for cement which will be

\* See Table 6, Appendix A, p. 18, below.

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accelerated by the higher priority being given to housing and to the usage of precast concrete. As in the past, the Satellites probably will continue to rely primarily on the construction of new plants to expand production capacity. In addition, the growing use of slag will permit increases in production with a minimum of investment, although this may tend to lower the average quality of the cement produced. Planned increases in the use of slag probably will be achieved, but past failings in completing new plants on schedule, as well as the slow utilization of new capacities, probably will continue to cause underfulfillment of some production plans.

Although production plans were fulfilled in a majority of the European Satellites in both 1957 and 1958, a lower level of fulfillment is to be expected for the 1960 goals, as the long-term plans for 1960 are overambitious and new plant completions continue to lag. It is estimated that production in 1960 will total 21.7 million tons, which is 23 percent above the level of production in 1958, although plans\* require a 30-percent increase to 23 million tons. Thus plan fulfillment is estimated at 94 to 95 percent. However, the estimated average annual rate of increase of 10.7 percent is higher than the rate of 9.8 percent achieved between 1950 and 1958, although it falls short of the planned 14.0-percent increase.

Net exports are expected to remain close to the level of 1957 -- that is, from 1.5 million to 1.8 million tons -- so that approximately 5.5 million tons of additional cement will be available for domestic consumption in 1960. The availability of over 20 million tons of cement in 1960 (35 to 40 percent more than in 1957) will permit a considerable expansion of construction in the European Satellites, but the expanding need for cement in construction and the underfulfillment of cement production plans will continue to cause some shortage of cement and require substantial investment to further expand the cement industry long after 1960.

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\* Because the Five Year Plan in Bulgaria terminates in 1962 and no 1960 plans have been announced, the 1960 plan was estimated.

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APPENDIX A

STATISTICAL TABLES

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Table 4

Estimated Per Capita Consumption of Cement in the European Satellites and Western Europe  
1950 and 1957

Country	1950 (Kilograms Per Capita)	1957 (Kilograms Per Capita)	Index (1950 = 100)
Albania <u>a/</u>	61 <u>b/</u>	60	98 <u>c/</u>
Bulgaria <u>a/</u>	58	89	153
Czechoslovakia <u>a/</u>	161 <u>d/</u>	273	170
East Germany <u>a/</u>	66	186	282
Hungary <u>a/</u>	86	100	116
Poland <u>a/</u>	87	160	184
Rumania <u>a/</u>	31	80	258
Average for the European Satellites <u>a/</u>	80	152	190
Average for Western Europe <u>e/</u>	148	249	168

a. Consumption, from Table 2, p. 9, above; population, 49/.

b. 1952.

c. 1952 = 100.

d. Production (assumed to be the same as consumption). See Table 2, footnote d, p. 9, above.

e. 50/

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Table 5  
European Satellite Trade in Cement with the USSR  
1955-57

	1955 a/		1956 b/		1957 b/	
	Thousand Metric Tons	Percent of Total Imports or Exports to the USSR	Thousand Metric Tons	Percent of Total Imports or Exports to the USSR	Thousand Metric Tons	Percent of Total Imports or Exports to the USSR
Imports from the USSR						
Bulgaria	1.3	0.5	4.7	1.7	1.0	0.4
Czechoslovakia	0	0	3.6	1.3	1.0	0.4
Total c/	<u>1.3</u>	<u>0.5</u>	<u>8.3</u>	<u>2.9</u>	<u>2.0</u>	<u>0.9</u>
Exports to the USSR						
Bulgaria	101.6	10.2	143.0	7.2	132.2	6.0
East Germany	65.6	6.6	61.0	3.1	3.7	0.2
Hungary	0	0	69.4	3.5	0	0
Poland	63.0	6.3	318.8	16.1	18.8	0.9
Rumania	415.8	41.8	512.2	25.9	554.7	25.2
Total c/	<u>646.0</u>	<u>65.0</u>	<u>1,104.5</u>	<u>55.8</u>	<u>709.4</u>	<u>32.2</u>
Percent of total net exports		23.4		41.8		51.9

a. 51/

b. 52/

c. Totals are derived from unrounded data and may not agree with the sum of their rounded components.



Table 6

Estimated Number of Cement Plants and Average Production per Plant in the European Satellites  
1958

<u>Country</u>	<u>Number of Plants</u>	<u>Total Production a/ (Thousand Metric Tons)</u>	<u>Average Output per Plant b/ (Thousand Metric Tons)</u>
Albania	2 <u>c/</u>	78	39
Bulgaria	4 <u>d/</u>	934	234
Czechoslovakia	15 <u>e/</u>	4,100	273
East Germany	14 <u>f/</u>	3,558	254
Hungary	6 <u>g/</u>	1,302	217
Poland	20 <u>h/</u>	5,041	252
Rumania	12 <u>i/</u>	2,687	224
Total	<u>73</u>	<u>17,700</u>	<u>242</u>

a. See Table 1, p. 3, above.

b. Total production divided by the number of plants.

c. See I, A, p. 2, above.

d. 53/. Cement Plant No. 5 is mentioned, but it was not completed in 1958.

e. 54/

f. 55/

g. 56/

h. 57/. The plant planned for completion in 1958 is believed to have been completed (Wiek III).  
About one-third of these plants have only grinding facilities.

i. 58/

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