

## M E M O R A N D U M

### THE COMMUNITY'S INVESTMENT NEEDS FOR PRIMARY RAW MATERIALS

The outline of capital requirements set forth in this Memorandum has been prepared for the purpose of illustrating, in a general way, the problems which the enterprises of the Community will face over the next few years. It is not intended as a definitive description of specific projects.

Many enterprises have prepared modernization and re-organization projects in order to adjust to the new conditions of competition in the common market. In order to indicate the general order of magnitude of the financial needs of the enterprises, the High Authority asked them for information on their plans.

The High Authority's first survey, which is still under way, has been limited to projects which will produce substantial results within the period 1954-1957. That period will be a crucial one for the Community since during the next four years the individual enterprises will be required to adjust to the new conditions of competition created by the establishment of a single market for coal and steel. The period is long enough for practical results; it is short enough for fairly safe predictions.

In reviewing the information received from the enterprises on the projects they are planning to undertake, the High Authority has given consideration to the effect of the single market on the development of demand, the requirements for raw materials, and the locations and pattern of production. The High Authority has not undertaken to develop an over-all investment program since under the Treaty the maximum of initiative is to be left in the enterprises. It has sought, however, in the tradition of the prudent lender, to check information supplied by the enterprise against the estimated demand for coal, metallurgical coke, and iron ore during the period in question.

In the light of a probable increase in the demand for steel over the next 4 or 5 years, supplementary quantities of raw materials would be required. The problem of raw materials for the Community is not, however, merely the assurance of an adequate supply of raw materials, but the assurance of an adequate supply at lower cost. Today the high prices of the raw materials for steel production are a factor that serves to inflate the entire price structure of the Community.

A reduction in raw material costs for steel will, in the competitive climate of the single market, bring about a reduction in steel prices. This, in turn, will tend to produce lower price levels for manufactured products, and increase the consumption of steel.

European basic industry has never shown any inherent deficiency in inventiveness, diligence, or engineering or administrative skills. Even during periods of capital shortage new methods of extraction and utilization of coal have been constantly developed and perfected. But without adequate investment the discovery of new methods is not enough and, for a long period from about 1930-1946, the flow of investment into European basic industries did not keep pace with technology. The importance of capital is clearly demonstrated by the fact that, in those sectors of production where investment has been substantial since the war, there has been an impressive increase of efficiency.

In administering such investment capital as may be at its disposal, the High Authority will take into account the anticipated results in productivity and production. A project will be eligible for a loan only when the applicant enterprise can demonstrate that the project meets satisfactory technical criteria and that there is a reasonable assurance that the investment can be amortized within a reasonable period. The ultimate decision will depend upon a judgment as to whether there is reasonable ground for believing that a project can pay off financially in the context of the competitive common market.

The investment projects for increasing productivity and production with respect to raw materials fall principally into the following categories:

1. Projects to increase productivity and improve production with respect to coal.
2. Projects to modernize and construct power stations at coal mine pitheads.
3. Projects to modernize and rebuild coking plants.
4. Projects to modernize, mechanize and increase the production of iron ore mines, as well as facilities for the treatment of iron ore.

I.

INVESTMENTS FOR COAL PRODUCTION

These projects are designed to achieve two essential objectives: first, to provide adequate and efficient physical facilities required in working the mines; second, to assure the necessary labor supply.

To achieve the first of these objectives, the mines themselves must be modernized and mechanized; in some cases, operations must be concentrated or substantially expanded. To achieve the second of these objectives, adequate housing must be provided near the mines.

A. Investments required in modernizing, mechanizing, expanding and concentrating the physical facilities for mining coal.

The war resulted in direct damage to many coal mines and in the deferment of maintenance and replacement of facilities for coal production generally throughout the Community. In the last few years substantial investment has been made in certain of the coal fields for the modernization of equipment and the concentration of facilities. This is particularly true in the coal fields of the Nord and Pas-de-Calais, Lorraine and the Saar. The investments in those fields have "paid off" in terms of a substantial increase in productivity over the pre-war level. In other coal fields of the Community, such as the Ruhr, Aachen, South Belgium, Campine, and Limburg, where deferred maintenance has not been counteracted by substantial postwar investment, output per man shift underground is, without exception, lower than before the war. The foregoing is illustrated by the following table:

Output Per Man Shift Underground in Coal  
Fields Receiving Substantial Post-War  
Investment  
(in kilograms)

	<u>1938</u>	<u>1950</u>	<u>1952</u>
Nord & Pas-de-Calais	1,136	1,089	1,228
Lorraine	2,014	1,765	2,018
Saar	1,570	1,498	1,623

In interpreting these figures, productivity should not be confused with production. Total production has tended to increase in all of the Community's coal fields, but this has resulted principally from an expansion of the labor force.

In the Ruhr, for instance, production increased during the postwar years from 1946 to 1953 by 129%, but output per man hour increased by only 23%.

(1) Concentration of pits. Approximately 16% of the coal mined in the Community comes from pits that produce less than 300,000 metric tons each year. Such a rate would not be abnormally low by American standards, since in the United States 40% of the total output comes from mines producing less than 180,000 metric tons each year. In the Community, however, fixed costs are much higher because of geological conditions and the greater depths of workings, and, as a result, 300,000 metric tons a year per pit are usually considered a minimum for economical operation. The optimum lies between 1 million and 2.5 million tons a year for each pit, depending upon the nature of the deposits.

But the lack of available investment capital in the Community has resulted in the continued working of pits far below the optimum size, as shown by the following table for 1952:

<u>Field</u>	<u>Total Annual Production</u> (millions of metric tons)	<u>Number of pits</u>	<u>Average Production Per Pit</u> (metric tons)
COMMUNITY	238.8	496	481,000
Ruhr	114.4	130	882,000
Aachen	6.4	8	798,000
Lower Saxony	2.4	4	583,000
South Belgium	20.7	136	152,000
North Belgium	9.7	7	1,387,000
Nord & Pas-de-Calais	29.4	89	330,000
Lorraine	12.2	9	1,357,000
Centre & Midi	13.8	80	172,000
Saar	16.2	17	955,000
Netherlands (Limburg)	12.5	12	1,044,000

In many cases the enterprises plan to close shafts that produce less than 300,000 tons a year or to convert them into service shafts. In this way the benefits of large-scale production can be achieved. In the shafts that remain open more modern underground equipment can be employed while surface facilities (particularly cleaning plants) can be concentrated with a substantial saving of costs. Through concentration and modernization of existing pits the enterprises expect not only to increase efficiency but also to provide the greater part of the necessary additional production.

An example of the improvement that may be expected is shown by the proposed concentration of pits in the Nord and Pas-de-Calais. This program is already in the course of development and results are already being achieved.

Concentration Program of the Nord  
and Pas-de-Calais

	<u>1951</u>	<u>1953</u>	<u>Forecast, 1956-57</u>
Mining shafts	98	89	73
Production (millions of metric tons per annum)	28	27.6	30 to 31
Output per man-shift under- ground (kg.)	1,175	1,277	1,500

(2) Modernization of equipment. The investments to modernize existing mines will affect all stages of extraction. There will be a further mechanization at the coal face and in the loading of coal at the face and a very significant concentration of working faces. Preparation plants will be modernized in order to create additional capacity, to improve quality, to reduce the cost of maintenance and the loss of coal in the rejects.

The priority projects in the coalfields producing coking coal will affect different fields differently with respect to total output from each. Thus, in the Ruhr, in Lorraine, in Campine and in the Saar, most of the projects that aim at improving efficiency in existing mines will result also in increasing the total production of the fields as a whole.

On the other hand, in the coalfields of the Nord and Pas-de-Calais the concentration of the pits, while increasing production in some mines, will mean the closing of others, and the total production for the field will not be greatly changed. At the Limburg (Netherlands) mines, which present a third situation, the cost of production now among the very lowest in the Community, probably cannot be further reduced because the coal must be mined at rapidly increasing depths. The projected investment will hold costs down to a point where they will continue to be competitive and will keep production from declining because the increased efficiency will offset the deterioration in physical conditions.

(3) Benefits and Cost of Coal Projects. The various projects contemplated for improving the production of coal through the modernization and mechanization of the mines should have the effect of substantially increasing the output of coal per man-shift underground.

The anticipated increase in the productivity of the underground labor force would mean a reduction of at least 50¢ in cost per metric ton extracted. These savings applied to the present tonnage of coal produced in the Community will lead to a substantial reduction in costs.

B. Investment in miners' housing necessary for increased labor efficiency and mobility.

Neither production nor productivity in the coalfields can be materially improved unless the necessary labor is available in the right place and at the right time. These requirements pose a grave problem of housing, which must be solved along with the problem of modernization of machinery.

Housing accommodations near the mines often are scarce and of poor quality; in many cases, accommodations are not available for the miners with their families, and some of them are housed in barracks with unspeakable sanitary conditions. Many miners are forced to live far from the mines; some of them must travel as much as five hours a day, and the enterprises have to furnish the necessary transportation at considerable expense. Of the 650,000 miners now employed underground in the Community's coal mines, about 10% are so badly housed as to interfere seriously with labor efficiency and to increase absenteeism.

As a result mainly of poor housing, labor turnover is high, particularly among the young men on whom rests the hope of the future. An example of the instability of the labor force is furnished by the mines in Western Germany, where between 1945 and 1953 the mines signed on 735,000 new workers, of whom only 208,000 are still at work. Turnover of these dimensions disrupts the staff, hampers efficiency, and makes it impossible to train a new generation of skilled miners in numbers sufficient to make up the loss caused by normal retirement.

The housing shortage creates an element of rigidity which hinders the coal industry in responding to a rise or shift in demand. The establishment of the single market will lead to labor dislocations as mining activity declines in unprofitable areas and increases in others; housing must be made available in the areas to which displaced personnel

will have to move. A present example is the need for accommodating miners who are being shifted from the center and south of France to the Lorraine basin.

One of the factors that have kept housing starts down is the high cost of construction. This high cost results not only from the handcraft methods and rudimentary organization of many of the building firms, but also from the want of continuity in carrying out housing programs once they are begun.

A mass program of miners' housing construction is essential. About 60,000 existing dwelling units have to be replaced; another 40,000 will have to be built at the coal mines that are expanding their production.

Depending upon local conditions, the extent of participation by the enterprises, by local authorities and by national governments will vary from one area to another. The High Authority expects to see that the best house-building practices are used throughout the Community as a step in reducing construction costs. It should be possible to use both labor and capital in the housing industry more efficiently, to reduce overhead, and to promote the utilization of standardized, and particularly of prefabricated, materials.

## II.

### INVESTMENTS FOR POWER STATIONS AT COAL MINE PITHEADS

The coal-burning power plants at the pitheads are an essential part of the coal economy. Besides furnishing power for the operation of the mines, they provide an important source of power for the general public through the grid. The consumption of power is growing at the rate of about 7% annually, a large portion of which must come from new coal-burning plants. It is therefore of great interest to the Community that the generation of power at pithead stations be pushed to the maximum economic limits in order to use low-grade waste coal not otherwise marketable.

Modern high-pressure, high-temperature, power plants can use waste coal in pulverized form and therefore can produce power cheaply by utilizing a mining by-product otherwise wasted.

Many mines now have no outlet for the low-grade high ash coal the production of which is increasing in volume as a result of increasing mechanization. Some of these mines produce power in old-fashioned plants which cannot use low-grade coal. They thus consume good coal which the mines could otherwise sell at a profit. The investment program therefore will concentrate on rebuilding existing old-fashioned plants and on building completely new plants at mines which produce low-grade coal without a present outlet for it. This program will release coking coal which now is used in antiquated power plants and thereby augment the supply available to coke ovens. Furthermore, as the modern boilers will have a thermal efficiency of 85% to 90% instead of 50% to 60% in the old ones, they will use a smaller tonnage of high-ash coal per kilowatt hour than the old boilers used of high-quality coal.

In France, where the modernization of pithead power stations has been under way for several years, the investments required are mostly for new plant. France has already obtained significant results. In 1947 some 39% of the coal used at pithead power stations was merchantable coal; the installation of modern equipment reduced this figure to 9% in 1952 representing a very large increase in use of high ash coal theretofore wasted. Furthermore, in 1952 France used 40% to 45% fewer calories per kilowatt hour than in 1947.

In Germany, where 35% of the boilers at the pithead power stations were installed before 1925, the problem is to modernize existing plant. These old boilers, and even some of the slightly newer ones, must burn merchantable coal and cannot economically use exclusively low-grade coal, which represents an increasing fraction of the total output of the mines.



The investment projects for the Community as a whole call for the retirement of over 0.7 million installed kilowatts of old plant, which use merchantable coal, and the installation of new equipment with a total capacity of 1.7 million kilowatts, all of which will use low-grade coal. The retirement of the old plant will save between 3 and 4 million tons of coking coal. The new plant, with an installed capacity equal to more than twice that of the old plant to be retired, will put to productive use over 6 million tons of high-ash coal now wasted.

### III.

#### INVESTMENTS FOR COKING PLANTS

Since the end of the war, there has been a recurrent shortage of capacity to produce metallurgical coke for the blast furnaces, notably before 1948 and in 1950-1952. Although the production of metallurgical coke has been rising gradually, the capacity for production must be increased over the next few years. In the Community the coking plants are generally owned by the coal mines. The investment projects cover these coking plants, as well as some owned by steel enterprises, and independent plants.

The projects for the rebuilding of existing batteries show the way in which the modernization of old facilities--which anyhow have to be renewed on an average of once in 20 years--can contribute to a reduction in cost, to an increase in revenue and to an increase in capacity.

(a) The new equipment will increase the caloric efficiency of the ovens so that it will take less gas to heat them; this means that more of the gas generated in the coking process can be sold for general industrial use. In some German coking plants such modernization has led to an average gas saving of 16% in comparison with pre-war consumption, and even this figure may be raised by the application of still newer techniques.

(b) The new equipment will increase the recovery of by-products--tar, gas, benzol, ammonia, etc. The recovery of benzol, for example, will be increased by 10%.

(c) Certain grades of coal, hitherto unsuitable for the production of metallurgical coke, can be blended, crushed, and treated by new processes so as to become available for such use. This will help reduce the Community's long-range deficiency in the supply of coal for metallurgical coke.

(d) Worn out ovens will be replaced by larger new ovens capable of faster coking time.

IV.

INVESTMENTS FOR IRON ORE

The 1953 production of iron ore in the Community was as follows:

	<u>Millions of metric tons of raw ore</u>
Germany	
Salzgitter-Peine .....	7.6
Other .....	7.0
Belgium .....	0.1
France	
East .....	39.4
West, Center and South ....	3.5
Italy .....	1.4
Luxembourg .....	7.2
	<hr/>
	66.2

The Community is a net importer of iron ore mostly from Sweden. As high-grade iron ore is scarce throughout the world, any significant increase in the Community's ore supply must come in large part from internal sources.

Most projects cover both modernization of iron-ore mines for the purpose of reducing costs and expanding of capacity. Other projects cover the construction of preparation facilities which will also reduce costs and improve quality.

A. Mining

Although the Community's iron ore is low in iron content, the Community is relatively fortunate in the geologic character of its deposits.

In Lorraine, for example, which produces over 50% of the total production, the veins are fairly thick, uniform and flat, and American machinery and methods of mining are adaptable. In this field, the room-and-pillar system is being used, plus roof-bolting machinery whereby the roofs of the tunnels are secured rapidly and cheaply. American-type leaders, shuttle cars, and jumbos are in operation on a large scale. Output per man-day increased from 5.2 metric tons in 1938 to 6.75 metric tons in 1953. The extension of these methods will lead to a further increase in output per man-day to approximately 9 metric tons by 1957. The effect of these improvements will be to reduce the cost per ton mined about 50% in four years.

B. Preparation of Ore

As the iron content of the ore produced in the Community is low, beneficiation is necessary in order to upgrade the product charged into the blast furnaces. The ore is crushed, washed and agglomerated. The purpose of such preparation is to concentrate the iron-ore content, to supply consumers with products of uniform quality, and to make it possible to use small particles of ore that otherwise would be wasted. The ore is prepared either at the mines or alongside the blast furnaces. It assures a more uniform supply for the blast furnaces and helps improve the quality of pig iron. With a higher quality of ore, the consumption of coke per ton of pig iron can be reduced. For example, a steel mill recently installed equipment for pre-crushing, crushing, and agglomerating the iron ore, and reduced coke consumption in the furnaces by about 200 kilograms per metric ton of pig iron, a coke saving of around 15%.