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INFORMATION MEMO

THE EUROPEAN COMMUNITY'S LONG-TERM ENERGY PROSPECTS

Between 1960 and 1975 the European Community's energy requirements will rise from 460 million to 850 million tons of coal equivalent, but coal will only account for one third of this total from 1970 and Community coal will provide 15 - 23 % of energy supplies in 1975, the lower figure on the assumption that no assistance or protection is given to coal mining, the higher figure implying maximum assistance.

Most of the increase in requirements will thus be covered by imported fuels - particularly oil. It is hardly likely that Community coal output will maintain its proportionate contribution to fuel supplies. Its competitive position will not in the long term improve, and if there were no assistance scarcely half of current production would be competitive.

This raises the problem of maintaining coal sales at the desired level, the problem of oil supply policy and that of a system for developing nuclear power plants.

These are the main conclusions reached by the study of the long-term energy prospects of the European Community which has just been published by the Inter-Executive Working Party presided over by a representative of the ECSC High Authority. This is the first time on a European scale that specific forecasts have been made on energy in terms of quantities, prices and quality.

The study, which contains 250 pages, is not in itself concerned with economic policy, but it is intended to collate all information enabling the field to be defined and the effects of possible energy policies to be measured. From this point of view there is a definite connection between the study and the policy memorandum which the Inter-Executive Working Party submitted to the ECSC Council of Ministers on June 27, 1962: the study clarifies the hypotheses on which the memorandum is based and provides material for answering the main questions put by the Council on the competitive capacity of European coal, on subsidy arrangements, the conditions of oil supply, the prospects of atomic energy, etc.

The study was addressed to the ministers concerned in the six member countries and will also be sent to the Advisory Committee of ECSC and the Economic and Social Committee of EEC, which the High Authority has asked to submit formal opinions regarding the memorandum on economic policy.

Prospects for the different sources of energy

The introduction explains why particular attention had to be paid to defining long-term prospects: the year generally used as a point of reference is 1970, which is the end of the transition period for implementing the Common Market, but as far as possible corresponding figures have also been given for 1965 and 1975.

In many cases the combined figures suggested for the distant future must be regarded as orders of magnitude rather than precise data. In forecasting so far ahead there are many uncertain factors, and the authors have pointed to all possible margins of error; nevertheless they did not on this account abandon the attempt, for they considered that these elements of uncertainty did not materially affect the general conclusions by which political decisions must be guided.

1. Energy requirements

Given the outlook for rapid growth in the Community's economy (4.6 % per annum for the national product), total energy requirements should go up about 4 % per annum, rising from 460 million tons coal equivalent in 1960 to 700 in 1970 and nearly 850 in 1975.

Total consumption of primary energy

Million tons coal equivalent

<u>Country</u>	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>
Germany	129.0	180.9	205.3	239	282	338
Belgium	28.4	33.5	33.9	37	42	48
France	82.5	102.4	121.9	151	187	231
Italy	26.2	43.0	65.6	99	137	176
Luxembourg	3.0	4.9	4.6	6.1	6.6	7.1
Netherlands	20.0	25.2	30.1	38	46	56
<u>Community</u>	<u>289</u>	<u>389</u>	<u>461</u>	<u>570</u>	<u>700</u>	<u>847</u>

Breakdown by sectors of total requirements of primary energy

%

	1950	1955	1960	1965	1970	1975
Primary producers, processing and distribution losses (excluding electricity)	13.2	11.4	9.3	8.2	7.2	6.8
Iron and steel	10.2	11.0	11.3	11.2	11.0	10.1
Other industries	18.4	18.4	19.0	18.6	17.9	16.9
Transport	13.0	12.6	12.8	14.0	14.5	15.1
Households	21.1	22.1	20.9	20.2	19.0	17.8
Electric power stations						
a) Hydraulic, nuclear, etc.	6.8	7.4	9.2	8.5	8.9	9.5
b) Thermal	17.3	17.1	17.5	19.3	21.5	23.8
Total	100	100	100	100	100	100

The demand for energy is increasing in all sectors, but the pattern is changing. The most spectacular change results from the fact that electricity consumption will go up much more rapidly than that of other forms of energy. As the production of geothermic, nuclear and hydro-electricity can only meet a very modest proportion of the increase in demand, thermal power stations will have to meet most of it.

2. Community coal

By about 1970 coal will no longer meet much more than one third of requirements. Even if the current level of production were maintained, Community coal could therefore only cover a decreasing proportion of energy requirements.

Even today, on the basis of current prices of competing products (imported coal and fuel oil), Community coalfields are much less competitive than they were.

It is true that competition at the moment is operating in conditions that may be considered to be to the disadvantage of coal, certainly because of the variety of rules of competition governing the markets in the various products concerned, and doubtless also because of losses on closing pits. Furthermore, for imported products some of the low prices recorded in recent years may be regarded as exceptional.

However, even assuming that those disparities are remedied and the market returns to normal (which implies some hardening of the price of imported products), there will be no lasting improvement in the competitive position of coal. This is because, even if we assume a high growth rate for "underground output" in Community coalfields (about 70 % in 15 years), wage increases will probably put up costs.

Output per man/shift (in kg)

	<u>1960</u>	<u>1965</u>	<u>1975</u>
Ruhr (including Aachen)	2185	2700	3750
Saar	2055	2700	3700
Campine	1790	2350	3200
Southern Belgium	1450	1760	2390
Nord/Pas-de-Calais	1560	1680	2490
Lorraine	2580	2850	4220
Limburg	1830	2380	3530

The wage trend

In the forecast of wages up to 1965 the study accepts the figures suggested by the experts consulted. From 1965 onwards it has been assumed that wages will follow the movement of per capita income.

Thus it is implied that broadly speaking the gap existing in 1960 between miners' earnings and the average earnings of other workers will not change. The wage rates should rather be considered as minimum hypotheses.

3. Imported coal

For steam coal imported from the USA it may be estimated that the average price in 1970 will be between \$ 13 and 13.5, while for American coking coal the price will vary according to quality between \$ 14.5 and 16.5 delivered to North Sea ports.

Depending on whether the Community follows a policy of giving maximum assistance to Community coalfields or a policy of non-protection, coal imports, which are now 13 million tons, will go up either to 100 million tons or to 40 million tons.

4. Oil and natural gas

The long-term prospects suggest that, even if account is taken of the increase in other Community production, imports will have to cover an increasing proportion of requirements, most of these imports consisting of crude oil. There will be an increase in tonnage, which means that the Community must ensure that it has adequate transport facilities. Imports will rise, in terms of requirements, from one third to-day to more than half in 1970, which will give added significance to problems of security of supply and price stability.

Proven oil reserves are currently put at 41,000 million tons for the whole world, which at the present rate of extraction will last nearly forty years. In fact these reserves are only part of world resources, which should last for a very long time.

As for prices in the long term, the most reasonable assumption for Middle East crude, which accounts for more than 80 % of Europe's supplies, is that for some years prices will vary little from the present level.

Later, in view of the trend of development costs, prices will probably rise to between \$ 17 and \$ 19 per ton delivered to North Sea ports - a substantial increase on present prices.

The Community's proven reserves of natural gas are estimated at 560,000 to 850,000 million cubic metres.

The geographical situation and length of the present pipelines have been decided in relation to the aims of national or regional economy, which themselves take into account the needs of the market, particularly the market in competing sources of energy.

Production of natural gas has more than quadrupled since 1958. In 1975 Community production will be between 32,600 and 42,100 million cubic metres, which with imports will ensure Community supplies of between 53,000 and 62,000 million cubic metres (62 to 80 million tons coal equivalent) in 1975.

5. Atomic energy

On the basis of available information there is every reason to believe that by 1970 large atomic power stations will be in a competitive position to cover the base of the load diagram. The novelty of the atomic energy industry will raise a number of problems for many supply industries such as mechanical and chemical industries and civil engineering.

Plans to speed up the rate of development will not mature for some years and must therefore be made now.

In 1970 the contribution of nuclear electricity to the Community's energy supply will be 8 million tons coal equivalent, but in 1975 it will be between 24 and 40 million, or 3 to 5 % of total supplies. The proportion of electricity produced by means other than thermal power stations will thus rise from 9.2 % in 1960 to 10 or 12 % in 1975.

General conclusions

This work makes it possible for different types of possible energy balance to be drawn up, assuming freedom of choice for the user but taking account of different degrees of assistance to coal mining and of protection against imported energy.

Pattern of the Community's energy supply in 1960 and 1975

percentage of total

	Community production		Imports		Total	
	1960	1975	1960	1975	1960	1975
Coal	51	15-23(1)	3	11-5	54	26-28
Brown coal	6	4	1	-	7	4
Petroleum	4	2	23	50-44	27	52-46
Natural gas	3	5-7	-	3	3	8-10
Hydraulic electricity	9	7	-	-	9	7
Nuclear electricity	-	3-5	-	-	-	3-5
TOTAL	73	36-48	27	64-52	100	100

(1) The higher figure assumes a policy of maximum assistance to Community coal, the lower figure assumes no protection at all. The converse is true of the figures for imports.

Since the c.i.f. prices of imported products and the production costs of Community coal will show a different trend, and in spite of the increase in energy requirements, the amount of Community coal that will be competitive if there is no assistance at all seems only slightly more than half of current production.

Furthermore, even if maximum assistance to Community coal is assumed, the proportion of imported fuels will increase very considerably and will be more than 50 % of requirements.

In view of security factors and social and regional considerations, assistance will have to be given to the coalfields to keep their output and sales higher than would result from a level of competition based on purely economic analysis.

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Without prejudice to issues of energy policy, three basic problems emerge from the economic analysis in this report:

- (a) Ways and means must be found to keep sales of coal in the Community at the desired level. These measures should be designed to stimulate rationalization in Community coalfields. In view of the considerations mentioned above, they should ensure that the main Community coalfields are kept in production.
- (b) A policy must be framed for the supply of imported fuel, particularly crude oil. The principle of Community supply at the lowest cost must be regarded in the fairly long term and conditions must be found that will prevent an artificial price increase, despite the fact that the Community is largely supplied from producing regions with the lowest operating costs.
- (c) A study must be made to determine the optimum rate of developing atomic energy plants. Within 15 to 20 years, atomic energy will strengthen the security of energy supplies in the European Community.

Thus any solution to one of these problems leaves some latitude for dealing with the other two. Nevertheless, it can be observed that the increasing proportion of imports in the Community's energy supply (which puts the Community in a very different position from that of the other large economic units) calls for a very open market so that the cost of supply can be reduced as much as possible, but the natural corollary of such an attitude is that a common energy policy must be adopted that will provide security of supply, without which the aim of low costs can never be reached.