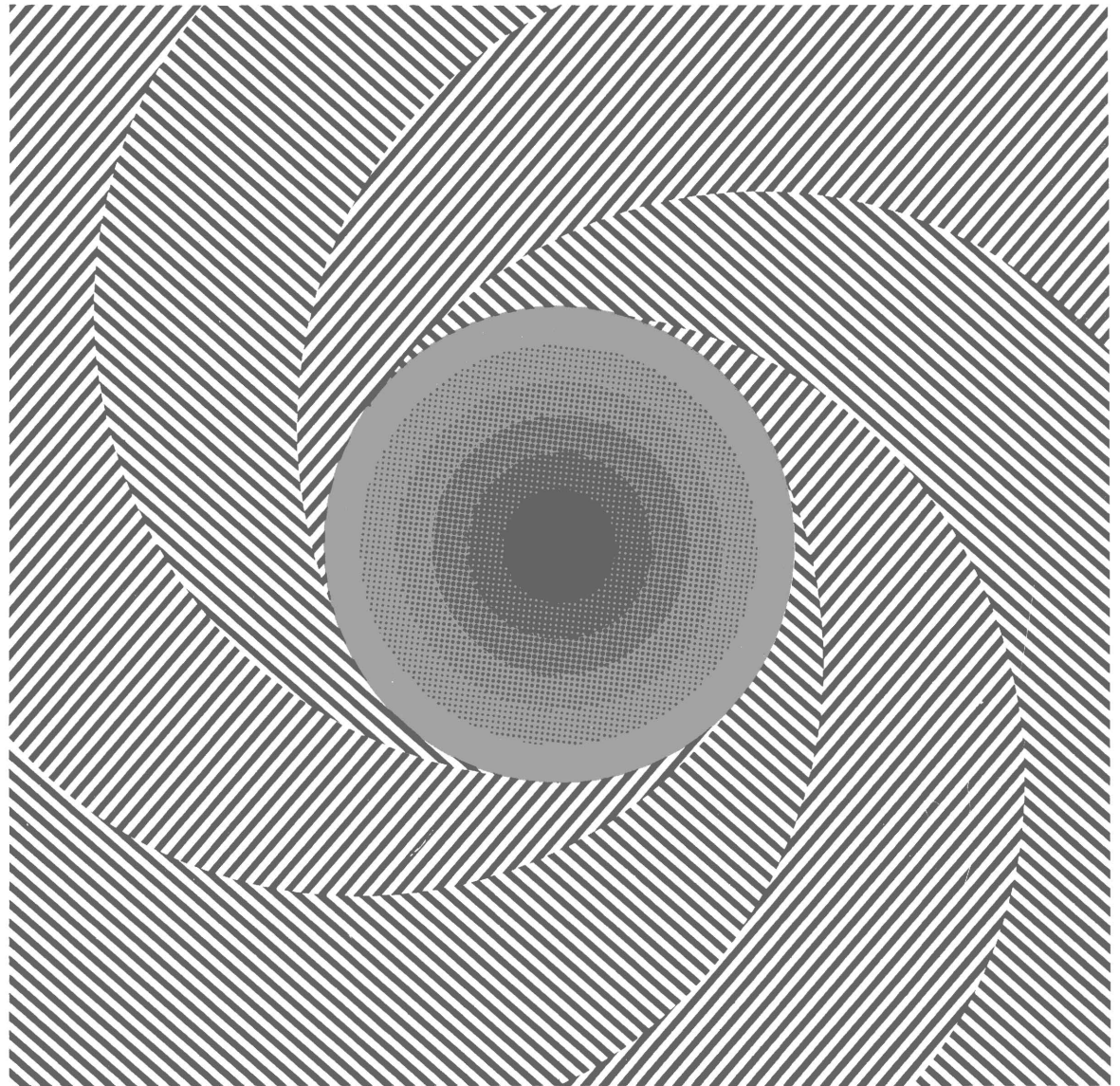


energy and europe



ENERGY AND EUROPE

Contents

What is energy and how much do we consume today?	1
How will the EEC energy market develop in the next few years?	5
What has become of these proposals?	8

WHAT IS ENERGY AND HOW MUCH DO WE CONSUME TODAY?

To borrow Mephistopheles' famous words, energy is very special stuff. Without it no modern economy could function; the Earth would be dark, people would freeze, machines would come to a standstill. A few figures will serve to illustrate the important role that energy plays in economic life: Each year the industries of the six Community countries invest about a quarter of their total outlay in the energy sector. This corresponds to a sum of about 25 000 million dollars. Just under one-fifth of the Community's total imports is accounted for by energy imports from non-member countries. This represents a value of about 9 000 million dollars a year. In the iron and steel industry the proportion of total production costs taken up by energy is 20-25%; in the chemical, cement, ceramics, glass and non-ferrous metals industries the figure is 15%, while in the food industry it is about 10%. Over one million people are employed in the energy sector of the EEG as a whole. Finally, the firms active in the energy sector are among the largest of all the Community undertakings. "Energy availability" is an essential factor in the siting of industry and is often decisive for the economic and social development of a region. In view of these orders of magnitude it would seem justified to devote special attention to the problems of energy economy and energy policy.

Before its conversion, energy comes to us in the following forms:

- solid fuels (pit coal and lignite),
- liquid fuels (petroleum),
- gaseous fuels (natural gas and petroleum gas),
- water power, geothermal energy and nuclear energy for the production of primary electricity.

These are known as primary sources of energy. In order to render these comparable, the ton coal equivalent (tce) was introduced as a unit of measurement. This denotes the quantity of energy that is required in order to obtain

from any form of energy a calorific value equal to that of a ton of hard coal (= 7 million kilocalories).*

A country's per capita energy consumption is a valid indication of the standard of living of its population. In the EEC countries, the trend in this consumption between 1960 and 1970 was as follows:

Per capita energy consumption in the EEC countries (in kgce)

	1960	1970
West Germany	3 784	5 477
Belgium	3 584	6 023
France	2 698	4 231
Italy	1 301	2 935
Netherlands	2 705	5 316
Community	2 712	4 456

Source: Energy Statistics Yearbook, 1960-1970, published by the Statistical Office of the European Communities.

For purposes of comparison, the per capita energy consumption in the USA was already 8 000 kg in 1960 and has risen to 10 800 kg in 1969. In 1960 the figure for Great Britain was about 5 000 kg, for the USSR and Eastern Europe about 2 500 kg, for Japan roughly 1 200 kg and for Southern Asia 140 kg.

The gross domestic consumption of energy in the EEC countries has increased enormously during the last twenty years. From 300 million tce in 1950 it rose to nearly 850 million tce

* Since petroleum has in the meantime become the world's No 1 source of energy, the ton crude oil equivalent (toe) has in many countries been adopted as a yardstick. It is equivalent to 10 million kilocalories; 1 tce is thus equal to 0.7 toe

in 1970, an almost threefold increase. The average annual growth rate was 5.3%. The reasons for this upsurge are general economic development, rapid industrialization, technical

advances and the resultant raising of the standard of living. The total energy consumption can be broken down according to individual sources of energy as follows:

Domestic consumption of primary energy in the Community according to energy source
(in tce millions)

	1950	%	1960	%	1970	%
Pit coal	210	70	243	52	189	22
Lignite	23	8	32	7	33	4
Petroleum	35	12	139	30	501	59
Natural gas	1	—	13	3	73	9
Primary electricity	31	10	39	8	49	6
Total consumption	300	100	466	100	845	100

If this overall consumption is broken down according to individual sectors of consumption, the following picture emerges:

Breakdown of total energy consumption according to sectors (in tce millions)

	1950	1960	1970
Industry	122	204	315
— iron and steel industry	32	68	89
— chemical and other industries	90	136	226
Transport	41	58	108
— road transport	12	33	86
— other transport sectors	29	25	22
Household	78	124	269
Applications other than energy production		14	58
Energy sector	59	61	95
Gross domestic consumption	300	467	846

Source: Energy Statistics Yearbook, 1960-1970, published by the Statistical Office of the European Communities.

These two tables show the decisive changes that have taken place in the structure of the Community's energy consumption over the last twenty years:

— Coal is losing ground on the EEC energy market. From a previously dominant position with a 70% share in EEC energy supplies, it has gradually fallen back to a share of only 22% in 1970 and is continuing to decline.

— Oil has quickly gained ground. In 1950 it covered only 12% of the EEC's energy requirements; ten years later it already covered almost a third, and in 1970 over a half. During the Suez crisis in 1966 it became clear for the first time what a strong position oil had come to occupy in the Community's energy supplies.

The decisive breakthrough occurred in 1964: oil overtook coal. Since 1966 "black gold" has accounted for over half the EEC's energy supplies. Almost all of the additional demand that arose between 1960 and 1970 was met from petroleum products, which came on the world market in large quantities and at low prices. This was to the advantage of the consumer: he benefited from the fierce competition between the international oil companies for a slice of the EEC market.

— Natural gas, which is chemically related to mineral oil, appeared on the scene in the mid-fifties. Its progress during the last decade has been particularly impressive; owing notably to the soaring production in the Netherlands,

its share in the satisfaction of the Community's energy demand trebled from 3 to 9% during the period 1960-70. It also ousted coal from some of its traditional markets, thus contributing to the rapid decline in the consumption of that energy source.

— Nuclear energy has not fulfilled the initial expectations regarding its contribution to energy supplies. This is probably due not so much to deficient performance—performance levels have in fact reached the standards envisaged—as to the plentiful supplies of oil at low prices which have continually forced down the threshold of competitiveness of nuclear energy.

— In the individual consumption sectors, energy consumption has increased at varying rates. If 100 is taken as the index for 1950, it rose by 1970 to 264 in the transport sector, to 257 in industry and to as much as 358 in the household sector.

Household consumption has thus increased to almost a third of the total demand.

As a result of its continually rising oil consumption the Community has become increasingly dependent on imports for its energy supplies: this dependence on imports, expressed as the ratio between net imports, minus bunkering, and gross domestic consumption, rose from about 13% in 1950 to 30% in 1960 and 63% in 1970. The EEC countries most dependent on imports are Luxembourg, which has virtually no indigenous energy sources, Belgium and Italy, both of which are dependent as to 82%. For France the figure is 71%, for West Germany 48% and for the Netherlands 42%. It is noteworthy that only the Netherlands has been able to reduce its dependence on imports during recent years as a result of the discovery of the important natural gas occurrences in the north of the country. All the other EEC states have become more and more dependent on other countries over the last twenty years. With imports of 580 million tce (1970), the Community has become the world's biggest crude oil market.

Production, imports and exports, intra-EEC trade in energy (in tce millions)

	1950-54	1960	1970
<i>Production</i>			
total	293	323	331
— pit coal	229	227	161
— lignite	25	29	32
— petroleum	4	16	19
— natural gas	2	13	74
— primary electricity	32	38	43
— other fuels	—	—	2
<i>Imports</i>			
total	87	200	649
— coal	16	18	31
— crude oil	63	156	580
— non-gaseous			
petroleum products	5	20	28
— primary electricity	1	3	6
— miscellaneous	2	3	4
<i>Exports</i>			
total	29	45	83
— coal	6	4	1.5
— coke	5	4	3
— non-gaseous			
petroleum products	16	35	74
— derivative gases	—	—	2
— primary electricity	1	1	2
— miscellaneous	1	1	0.5
<i>Intra-Community trade</i>			
total	31	46	99
— coal	18	20	18
— coke	8	10	10
— non-gaseous			
petroleum products	3	12	53
— natural gas	—	—	12
— primary electricity	0.5	0.5	3
— miscellaneous	1.5	3.5	3

Source: Energy Statistics Yearbook, 1950-65 and 1960-70, published by the Statistical Office of the European Communities.

Energy production within the EEC has changed little since 1960. In the twenty years up to

1970 it rose only 10% from 300 to 331 million tce. The decline in coal production was offset by the expansion of natural gas production, which moved into high gear in the mid-sixties.

In 1970 the Community's energy exports to non-member countries reached a level of over 83 million tce as against 45 million in 1960 and 19 million in 1950.

Petroleum products, which accounted for a more or less constant 90%, were easily the most important export item in the Community energy balance. In 1970 the six EEC countries supplied each other with about 99 million tce of energy products. This is more than twice the corresponding figure for 1960 and more than three times that for 1950.

Whereas during the fifties and early sixties coal and coke took pride of place in intra-Community trade in energy, since 1965 they have been forced to yield more and more ground to petroleum products and natural gas. Oil products now account for over 50% of the EEC's energy trade. The table on page 3 gives details of the production of, and the external and intra-Community trade in, energy products.

HOW WILL THE EEC ENERGY MARKET DEVELOP IN THE NEXT FEW YEARS ?

First of all the question of demand: on the assumption of a similar rate of economic growth to that over the past two decades, energy consumption in the Community can be expected to rise by about 5% a year. In 1985 it would then amount to 1 800 million tce, or rather more than double the figure for 1970. As regards the breakdown of energy demand over the various consumption sectors, there will be little change from the present position. Demand in the household sector could be about 570 million tce of energy in 1985, i.e., about a third of the total consumption. Consumption in the transport sector can be estimated at 230 million tce, or about 13% of the total demand. This leaves 1 000 million tce, which will break down into 675 million tce for the industrial sector (consumption in the iron and steel industries will rise to 136 million tce, that in the chemical industry to 128 million, and that in other branches of industry to 423 million), 155 million tce for purposes other than energy production and 170 million tce for other consumption sectors.

How is this enormous demand to be met? If, as in the past, the satisfaction of the demand is left to the free play of market forces, then the pattern of supply for 1985 might be as follows: oil and oil products would cover about 62% of Community energy requirements, i.e., 1 100 million tce. Natural gas would increase its share to 16% or 295 million tce, and nuclear energy would account for about 10% or 175 million tce. Solid fuels would continue to decline in importance, contributing only 174 million tce or barely 10% (hypothesis 1).

However, an evolution along different lines is also conceivable (hypothesis 2). This would be dictated by the growing dependence on imports and the consequent increased burden on the balance of trade of the Community states; its outcome would be a restriction of the role played by crude oil in the satisfaction of the Community's energy requirements. This,

of course, presupposes concerted action in the following three areas:

— Increased availability of coal for use in power stations by 40-50 million tce. Since the Community's coal industry would probably be unable to supply this quantity at competitive prices, it would be necessary to fall back on imports.

— Investment in nuclear power stations would have to be spurred on. As a result of accelerated investment programmes it would have to be possible to achieve an installed nuclear capacity of 120 000-125 000 MWe in the Community by 1985, i.e., 20-25% more than the figure mentioned in current estimates as the limit for installed capacity.

— The quantities of natural gas available would have to be increased by about 75 million tce, which roughly corresponds to the current natural gas output in the Community. The additional quantities could come either from the EEC countries themselves or from non-member countries (hypothesis 2).

These measures offer the prospect of a reduction in petroleum's share in the satisfaction of the EEC's energy requirements to slightly over 50%, i.e., of reduced Community dependence on imports. At the same time, the contribution provided by natural gas would rise to nearly 20%, that by solid fuels to 12% and that by atomic energy to about 12%. These two "hypotheses" are summarized in the following breakdown. (see page 6)

The vague outline, at any rate, of a joint Community energy policy is now discernible. Here, as in so many other areas of EEC policy, there is basic agreement as regards the objectives underlying this joint policy, namely:

— cheapness of supplies to the Community, though the fundamental consideration here must be the lowest long-term cost to the Community rather than the lowest market price at a given time;

	Hypothesis 1	Hypothesis 2
solid fuels		
— in tce millions	174	214
— in %	9.6	11.8
petroleum		
— in tce millions	1 119	930
— in %	62.1	54.9
natural gas		
— in tce millions	295	350
— in %	15.5	19.7
primary electricity		
— in tce millions	222	272
— in %	12.2	15.9
of which:		
nuclear electricity	175	225
in %	9.7	12.4
total energy requirements		
— in tce millions	1 810	1 810
— in %	100	100

- security and continuity of supplies as regards both price and quantity;
- free choice of energy sources for the consumer;
- fair competition between the various sources of energy;
- avoidance of disruptions of social and regional structures due to the substitution of one energy source or another for reasons of economic necessity.

In Europe, the various energy sources are still the responsibility of different authorities. This is especially true as regards prices, commercial policy, taxation and investment policy. At the administrative level, at least, a single competent authority for the Community was created in July 1967 by the merger of its three executive bodies, namely the High Authority of the ECSC, the EEC Commission and the Euratom Commission. In law, however, the various

energy sources will continue to be governed by separate provisions until all three European Treaties are merged: coal by the ECSC Treaty, oil and natural gas by the EEC Treaty and nuclear energy by the Euratom Treaty.

The lack of a common energy policy cannot be blamed on the Community's executive bodies. Since the establishment of the Community they have repeatedly taken steps to launch a common energy policy. The following initiatives are worthy of note:

- the "Memorandum on Energy Policy", dated 25 June 1965, drawn up by the Inter-executive Working Party on Energy;
- the "Protocol to an Agreement concerning Energy Matters", adopted by the Council of Ministers of the EEC on 21 April 1964.
- the "Initial Memorandum on Community Policy concerning Petroleum and Natural Gas", issued by the EEC Commission on 14 February 1966.

However, apart from the fact that in 1965 the above-mentioned "Protocol to an Agreement" provided the basis for the (twice extended) decision of the Council of Ministers concerning a Community system of aids to the coal industry, and in 1967 that for the decision concerning the granting of aids to the EEC iron and steel industry in respect of coking coal, all these documents soon disappeared again into the drawers of the experts' desks and no further action was taken on them.

In December 1968, about 18 months after the merger of the three executives, the European Commission laid before the Council of Ministers its "First Guidelines for a Common Energy Policy", the basic principles of which are as follows:

- The energy policy should be aligned with the interests of the consumers by means of dependable supplies at prices which are relatively stable and as low as possible.

— In the energy sector, too, competition should in principle perform a regulating function. However, for reasons relating to the security of supplies and the structural characteristics of the energy market, a system of supervision should be instituted. Nevertheless, economic-policy measures which affect the free play of supply and demand should only be taken in cases of extreme necessity.

In its “First Guidelines” the Commission proposes the following three practical steps:

- the establishment of a general framework of action;
- measures aimed at setting up a common market for energy;
- measures to implement a policy of cheap and dependable energy supplies.

The framework of action provides for medium-term forecasts and guidelines, together with annual economic activity investigations. Continuous studies of potential supply sources, in conjunction with a policy of stockpiling, should help to avoid supply difficulties.

The aim of the Commission’s proposals for the setting up of a common market for energy is to bring about the free movement of goods (removal of the direct and indirect barriers to trade), freedom of establishment, equal terms of competition and equal taxation (uniformity of VAT, of specific consumer taxes on energy products and of fuel taxes).

In the coal sector, the Commission’s proposals for a policy of cheap and dependable supplies include a coordinated import policy, the adaptation of output to potential offtake, the concentration of production in the most productive pits and the introduction of Community aid systems. In the petroleum and natural gas sector, the measures aim primarily at the removal of disparities in direct taxation from which some firms in this sector profit within the Common Market. In addition, the Commission wishes to promote the acquisition of energy resources which can be of special

benefit to the Community’s supplies. Finally, with regard to nuclear fuels, the Commission wishes to create market-economy conditions of supply, and this presupposes an amendment of the Euratom Treaty provisions governing the Euratom Supply Agency.

WHAT HAS BECOME OF THESE PROPOSALS ?

The Commission publishes annual reports on the energy market, in which it examines the market situation and presents a brief forecast for the year ahead. During the current year, as and where it deems necessary, it also prepares short-term economic reports, which serve as a basis for consultations with the senior officials responsible for energy policy in the EEC countries.

A Commission report on long-term energy prospects is currently in the course of preparation. In addition, the Commission will shortly present "medium-term guidelines" for the oil and natural-gas sector up to 1985. Finally, in the field of nuclear energy, the Commission is working on the Second Illustrative Programme which covers the period 1975-85 but also outlines the prospects up to the end of the century.

In December 1968, in order to protect itself in the short term against the worst effects of disruptions of oil supplies, the Council, acting on a proposal from the Commission, adopted a Directive which imposes on the EEC States the obligation to hold minimum reserve stocks of petroleum—in the form of crude oil and/or refinery products—equivalent to 65 days' domestic consumption during the previous year. In July 1971, in view of the structural changes that have meanwhile occurred in the Community's crude oil supplies, the Commission urged that the obligation concerning the maintenance of stocks should be extended to 90 days' consumption. This period, which has still to be approved by the Council, would correspond to an OECD recommendation made in December 1970.

Among the measures aimed at the creation of a uniform market, and in addition to the provisions of a more general nature, which, however are of particular importance to the energy sector (e.g., the Commission's directive concerning the abolition of measures having the same effect as quantitative restrictions on imports, or its

directive on the equal treatment of domestic and foreign products in the case of supplies to the State, its regional and local authorities or other legal persons governed by public law), the following specific Commission measures concerning the energy sector should be mentioned:

First of all the Commission took up the matter of the French State oil monopoly. At the end of December 1969 it issued a recommendation to the French Government calling upon it to reshape this monopoly, i.e., to stop all forms of discrimination between nations of the EEC countries as regards supply and marketing conditions.

Likewise at the end of December 1969, the Commission promulgated a decision whereby those EEC States which impose import restrictions in respect of certain oil products are able to protect themselves against the importation from non-member countries of oil products which are not subject to any restriction whatever in other EEC States. This decision of the Commission, which at first might seem to run counter to the aim of setting up a uniform market, is intended to prevent the deflection of trade from one EEC State to another. This measure was initially valid until 31 December 1971, but has since been extended for two years until 31 December 1973. Prior to the introduction of these two measures the Council acting on proposals from the Commission had already approved various directives which guaranteed freedom of establishment and freedom to pursue certain activities in the energy sector (e.g., wholesale trading in coal and oil, prospecting and drilling for oil and natural gas).

The Commission has paid particular attention to the achievement of uniformity in the specific taxation of petroleum products in the Community—an important factor in the creation of equal internal-market conditions.

While fuels are generally subject only to turnover or value-added tax, petroleum products used as fuels are subject to a consumption tax, the level of which varies considerably from one EEC country to another, as the following table shows:

Consumption tax on heavy fuel oil and domestic heating oil, as at 1 January 1970
(in u.a. per ton)

	Heavy fuel oil	Light fuel oil
West Germany	6.83	2.73
Belgium	2	5 brs/ 8.43 (1)
France	0	4.05
Italy	4	8 brs/ 5.92 (1)
Luxembourg	2	9.16 brs/ 3.61 (1)
Netherlands	3.87	14.64

(1) Applied according to the quality of the oil.

In late 1970, in view of these discrepancies, the Commission submitted to the Council a proposal for a directive on the approximation of taxes on heating oil. This stipulates that after 1 January 1976 the EEC States shall impose only a specific conscription tax not exceeding 2 u.a. per ton on heavy fuel oil and not exceeding 5 u.a. per ton on light fuel oil.

The Commission is also taking steps to ensure coordination between the various national measures and the gradual introduction of Community rules. In this connection it has concentrated on certain aspects of the petroleum market, namely the construction and operation of refineries, pipelines and filling stations, together with the laws governing prices. Ad hoc groups have compiled comparative surveys of the policies pursued by the EEC States in these four areas.

The Commission will draw its conclusions in the light of these data and will then be able to take appropriate action.

Trade and supply policy is the be-all and end-all of any energy policy. Owing to the Community's marked dependence on imports for its energy supplies, this is especially true of the EEC countries. Consequently, the Commission has also paid particular attention to a policy that enables energy requirements to be met under the best possible conditions with regard to cost and security of supply. It considers it important that in the future, too, the coal industry should contribute as much as possible to the Community's energy supplies at reasonable cost and under satisfactory social conditions. In order to consolidate this role, a whole series of measures in favour of the EEC's coal industry have been enacted in recent years: for example, the period of validity of the system of Community aid to coal mining in the EEC countries (the well-known Decision No. 3/65 of the High Authority of the ECSC on subsidies) was prolonged in October 1967 and replaced in January 1971 by Decision 3/71, which will remain in force until 31 December 1975. This decision on subsidies is intended to simplify the necessary adaptation of the Community's coal industry to market conditions and its concentration in the most productive pits. In order to offset the financial burden resulting from total or partial pit closures, capital expenditure, personnel training and the formation and upkeep of special stocks which make for greater elasticity in the supply of Community coal, the EEC governments can grant aids, the compatibility of which with the decision on subsidies must be checked and approved each year by the Commission.

In February 1967 the High Authority took a further decision on the granting of aids, this time for deliveries of coking coal and coke to the EEC steel industry. This decision too was first of all also prolonged but subsequently superceded, as of January 1970, by Decision No. 70/1, which will apply until 31 December 1972. Under this "coking coal decision" the governments of the EEC States can grant aids

to collieries firms within their sovereign territories which deliver coking coal and coke to the steel industries of the Community countries, the object being to facilitate not only coal production but also the marketing of coal in regions remote from the mining areas or within the framework of intra-Community trade. The aid to production must not exceed 1.5 u.a. per ton and the marketing aid is on a degressive scale, namely 0.7 u.a. per ton during the first year, 0.55 u.a. during the second and 0.4 u.a. during the third year. Marketing incentives within the framework of intra-Community trade in coal are financed in accordance with a Community scale; they are, however, limited to a maximum volume of 17 million tons a year. In pursuance of these of these two decisions on marketing incentives for EEC coal, the EEC governments provided over 600 million u.a. in each of the years 1968 and 1969, for instance, about 540 million u.a. in 1970 and just under 500 million u.a. in 1971. When related to output, this amounts to about 3.4 u.a./t for 1968 and 1969, 3.18 u.a./t for 1970 and only 2.96 u.a./t for 1971. These figures, of course, do not include the adjusting amounts paid by the State in order to cover the deficits of the social insurance institutions in the coal industry. These totalled about 1 300 million u.a. in 1970 and almost 1 400 million u.a. in 1971.

So much, then, for Community commercial and supply policy in the coal sector.

In the oil and natural-gas sector the EEC has taken only the first steps towards the implementation of a common commercial and supply policy. On 18 May 1972, after more than two years of negotiations, the Council approved two regulations. The first of these lays upon Member States an obligation to provide the Commission every six months (by 30 March and 30 September at the latest) with data on their imports during the preceding year—broken down according to oil and

natural-gas undertakings—and to submit, before 31 December each year, overall data for all undertakings on probable imports during the following year. The second regulation provides that the EEC States shall notify the Commission annually (before 15 February) of all capital projects exceeding a certain size to be started by their oil, natural-gas and electricity undertakings in the spheres of transport, storage and distribution during the next three years.

In July 1971 the Commission proposed that undertakings whose activities are in the common interest as regards the Community's oil and gas supplies and which are established in at least two EEC countries should be granted the legal status of "Joint Undertaking". This status, for which provision is made in the Euratom Treaty in respect of nuclear enterprises, confers certain advantages such as tax reliefs, loan guarantees and loans at preferential rates of interest.

The proposals so far drawn up by the Commission in the nuclear energy sector are likewise designed to place the Community's energy supplies on a more secure basis. For instance, the Commission has suggested that it should itself borrow funds to provide loans to EEC electricity undertakings in order to facilitate, by means of repayable loans, the additional financing associated with the transition to nuclear energy, and thereby to promote the development of this new form of energy.

The Commission is also concerning itself with the necessary supplies of nuclear fuels to the Community. As long ago as 1964, the Commission proposed to the Council measures aimed at a revision of Chapter 6 of the Euratom Treaty, in order to make uranium supplies more flexible in the face of differing economic situations. The Council, however, was unwilling to entertain them. In 1970 the Commission

reformulated its proposals but was unable to bring the Council to accept them.

The Community has hitherto been entirely dependent on the USA for its supplies of enriched uranium. In 1958 and 1960 Euratom concluded supply contracts with the USA which, in view of the increasing development of the enriched-uranium market and the rising imports, can now in many respects be regarded as no longer meeting the requirements. In July 1972 the Commission therefore entered into negotiations with the US authorities with a view to improving the conditions of supply to the Communities. These negotiations are still under way. The USA has shown a fairly accommodating attitude on most of the points raised by the Community. Nevertheless, whatever guarantees for the supply of enriched uranium can be negotiated, the fact that the Community depends for its supplies of this fuel on a single source—which moreover is outside the Community—must cause some concern. The provision of a uranium enrichment plant inside the EEC which would come on stream by 1980 (by about which time the present available capacities would no longer be sufficient to satisfy the demand) would therefore coincide with the aims of the Community energy policy, namely to ensure supplies which are dependable as regards both quantity and price.

In May 1969 the Commission laid before the Council a proposal along these lines, which has since been the subject of an exhaustive investigation by a study group set up for that purpose. Difficulties arise principally from the fact that enrichment techniques (gaseous diffusion, gas centrifuging and nozzle separation) are being compared, the characteristics and performances of which are generally kept strictly secret and which, moreover, are at different stages of development.

The Commission has recently intensified its efforts to demonstrate the connection between

energy policy and policy in other fields. It recognizes that Community energy policy cannot be formulated without regard to the activities and ideas prevailing in adjacent areas of common policy. In particular, energy policy is closely linked with the problems of social and regional policy, those of research and technological policy and those of environmental protection policy, which has come strongly to the fore in recent times. Considerations of social and regional policy have played a decisive part in the formulation and implementation of the EEC countries' coal policy and of the measures taken at Community level. In this connection mention can be made of the measures for the labour redeployment and the conversion of undertakings, as a result of which the undesirable social consequences of a decline in the EEC coal industry have been avoided or at least kept in check. In any case, since its inception the Community, first of all via the High Authority and then via the Commission, has provided at least 100 million u.a. in aids to worker retraining and has paid out a total of 1 150 million u.a. in loans for the conversion of undertakings.

The coal subsidy decisions Nos. 3/65 and 3/71 were also justified, at least in part, by the concern to maintain coal production and marketing while at the same time avoiding an excessive reduction in colliery manpower.

In its "Second report on the relations between social policy and other Community policies", which it submitted to the Council in March 1970, the Commission pointed at the social aspects of the action required in the oil, gas and electricity sectors, as well as the problems relating to the coal industry. In the opinion of the Commission, all future action must be compatible with the social objectives of the Community Treaties, i.e., they must contribute towards raising the standard of living, creating more employment, improving the living and working conditions of workers and closing the

gaps in the health schemes for the entire population.

Regional and area planning aspects of energy policy arise primarily from the fact that the sources of energy will in future be better distributed throughout the Community, as a result of which the existing disparities will be reduced. Whereas previously the Community's energy supplies stemmed mainly from coal-mining areas in the interior of the Community, present-day supplies enter through the seaports which handle the fuel imports. In future a not inconsiderable proportion of these imports, particularly of natural gas, could be transported overland by means of pipelines. Finally, a salient economic characteristic of nuclear energy is that its generating cost depends only to a very small extent on the location of the nuclear power plant.

These various factors tend to alter the conditions governing the access of the individual regions of the Community to the sources of energy. The Commission feels that as regards this development the role of the energy policy must be to ensure that energy, which is thus more favourably dispersed, is also in fact marketed everywhere without hindrance. This would further promote the decentralization of industry and of the service sector, which is already in progress, and help to strike a better balance between the regions.

The link between energy policy on the one hand and research and technology policy on the other derives from the fact that the energy sector is characterized by a high degree of technological innovation. This means that energy policy must take account of the rapid scientific and technical progress. As far as the coal sector is concerned, the High Authority has from the outset striven for technical collaboration between the researchers and the coal-mining industry in the EEC countries. It has also provided financial assistance for research projects concerning

mining technology, coking techniques, fundamental problems of physics and coal chemistry, thermal valorization of coal, etc. In the nuclear energy field the Euratom research programmes extend to reactor technology and safety, biology, nuclear fusion, direct energy conversion, the fuel cycle, etc.

In conclusion, a few words on the links between energy policy and environmental policy. Energy plays a major role in atmospheric pollution. It is possible that the use of fossil fuels in various forms is responsible for 60-80% of atmospheric pollution. In addition, we have the thermal pollution of rivers and other waterways by the coolant from nuclear power stations and the radioactive emissions from these and other nuclear installations, Energy consumption, which will certainly continue to rise, will lead to increased atmospheric pollution unless effective counter-measures are taken. In July 1971 the Commission published its "First Communication on Community policy in the field of environmental protection", in which it set out its attitude to this problem and advocated action at an international level—but first and foremost at Community level—to combat damage to the environment. In this document it presented a number of objectives and the most urgently required measures for their implementation. In the energy field the first priority should be given to vehicle exhaust gases, sulphur emissions from electricity generating stations, refineries and other plants, together with the thermal pollution of surface waters by coolant discharges from power stations.

The Commission believes that these measures could be successfully carried out if the Community were empowered to issue appropriate regulations which would be directly applicable in each Member State and which on their adoption could either supercede the existing regulations of the individual States or close the gaps in the various national laws.

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