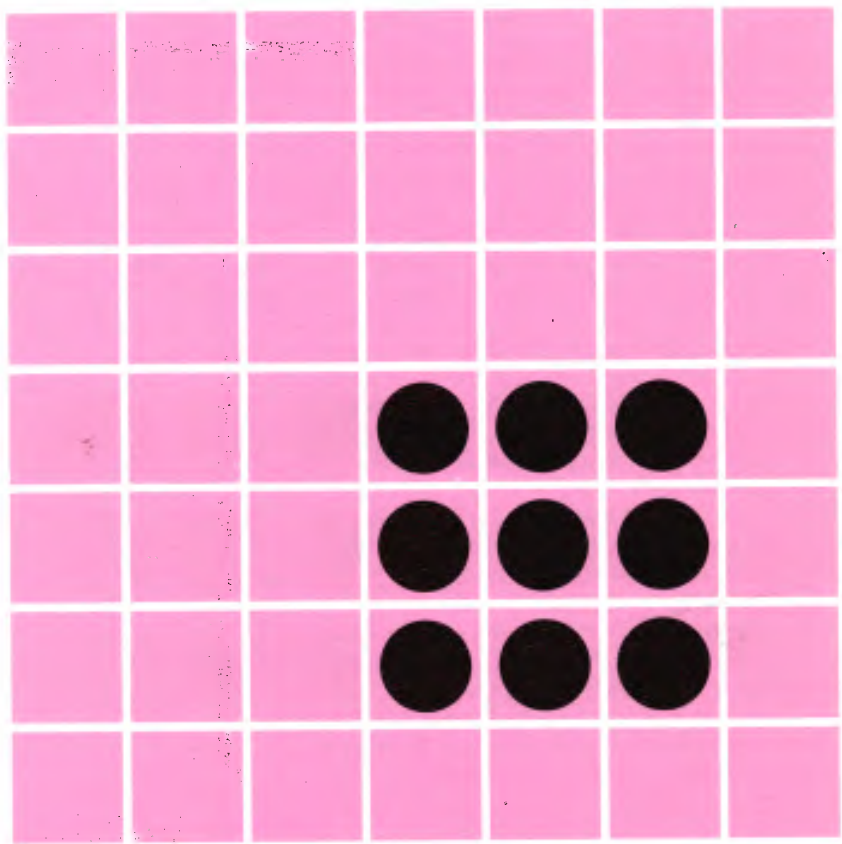


THE EUROPEAN COMMUNITY AND THE ENERGY PROBLEM

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Introduction

Belgium, Denmark, the Federal Republic of Germany, France, Ireland, Italy, Luxembourg, the Netherlands and the United Kingdom as members of the European Community share a common economic and social destiny.

The Community's 260 million citizens already enjoy an average standard of living among the highest in the world and if they are to maintain and improve living and working conditions they will require a regular, stable and adequate supply of energy at reasonable prices.

Energy is a determining factor in the operation and development of a modern economy.

The Community used to be relatively self-sufficient as regards its energy supplies, but over the last thirty years has gradually come to depend, as a whole, on imports — especially of oil — to cover much of its needs; total imports exceeded 60% in 1973 and are still over 55% today.

To begin with, this imported energy encouraged economic development and social progress within the Community countries, because of the low prices and regular deliveries.

But in the final quarter of 1973 and, once again in 1979, there were disruptions which have not ceased to be felt since. However, this energy crisis was only apparently precipitated by the political and military events which marked its beginning. Instead, its roots are to be found in the market patterns throughout the previous decades.

As early as 1962 the European institutions became aware of the need to control developments more effectively by means of a common energy policy and the three executives of the time defined its content and timescale.

The 'energy crisis' could only make the need for such a policy more imperative for it demonstrated clearly the vulnerability of the economy of Western Europe to supply restrictions and also to sharp increases in energy prices. Furthermore, it emphasized the effectiveness of isolated or uncoordinated national reactions, as well as the dangers of an absence of solidarity among the oil-consuming countries. Lastly, it showed the need for changing the pattern of supply so as to reduce dependence on imports: greater energy conservation, more intensive use of indigenous resources and the development of sources other than oil. Of these sources solar energy and controlled thermonuclear fusion have a promising long-term potential. However, these sources and the others being developed — geothermal energy, etc., can make only a limited contribution in the short and medium term. Nuclear energy, on the other hand, is able to make a more substantial contribution in the short term.

It must, however, be clearly realized that no discovery and no technical innovation — whether it be energy from nuclear fission, North Sea oil or gas, the possible underground gasification of coal, or even controlled thermonuclear fusion — can by itself solve the problem. Moreover, even a very intensive effort to increase self-sufficiency in the Community's energy supplies will in no way remove the need, during the foreseeable future, to have considerable recourse to imports.

The key to the future as regards energy, for the European Community as for any other developed geopolitical entity, lies in diversification: diversified requirements must be met by technically and geographically diversified sources of supply. It is, moreover, absolutely essential to normalize trade relations with the producing countries.

The mere spontaneous action of economic forces on the energy market quite clearly cannot guarantee the attainment of these objectives. It is necessary to have policy measures concentrated on energy but encompassing various facets: market organization, research and development, international relations, finance, etc.

The number and diversity of the economic and social factors which determine an energy policy or on which the latter may have repercussions mean that, in order to respect the unity of the Common Market and eventually achieve economic and monetary union, national policies must converge gradually to form a common policy. Moreover, the measures to be taken must be compatible with all common policies developed by the European Community. Solidarity allows the Member States to cope with problems beyond their individual capabilities and reduces the risk of duplication in research and investment while making it possible to share the cost of certain large-scale operations.

A common policy also makes it possible to take advantage of the economic and political strength of an entity of 250 million inhabitants in negotiations with the multinational oil companies, with other importing countries and even in the dialogue with the oil-producing countries.

However, a common energy policy is not a prefabricated system which can be imposed as a whole and at one stroke. Member States' energy situations differ widely and flexibility is therefore required — flexibility which will undoubtedly produce uncertainties and surprises.

The common policy is gradually being formulated through a series of decisions by the institutions of the Community, arrived at successively in the spheres in which a common attitude is considered feasible and advantageous, or urgent. However slow and unspectacular this painstaking implementation may appear, it must, nevertheless, be emphasized that the continuous inspiration for this work comes from a set of principles and objectives which form a coherent framework for future progress.

I Market trends before the crisis (1950-73)

With particular regard to Western Europe and more specifically the countries of the European Community, these trends exhibited the following features:

1. Volumes

In the course of the period — something under a quarter of a century — running from the early 1950s to the last years before the crisis, demand for energy — already high compared with the world average — increased very sharply. In the industrialized countries, primary energy consumption increased generally by more than 100% and, by 1973, the nine Community Member States had a combined energy consumption of almost 1 000 million tonnes oil equivalent (mtoe). At that time, there were no signs of demand saturation in Europe or of a decline in growth. The European Commission was still forecasting a doubling of energy requirements in fifteen years and estimated total requirements for 1985 at some 1 800 mtoe.

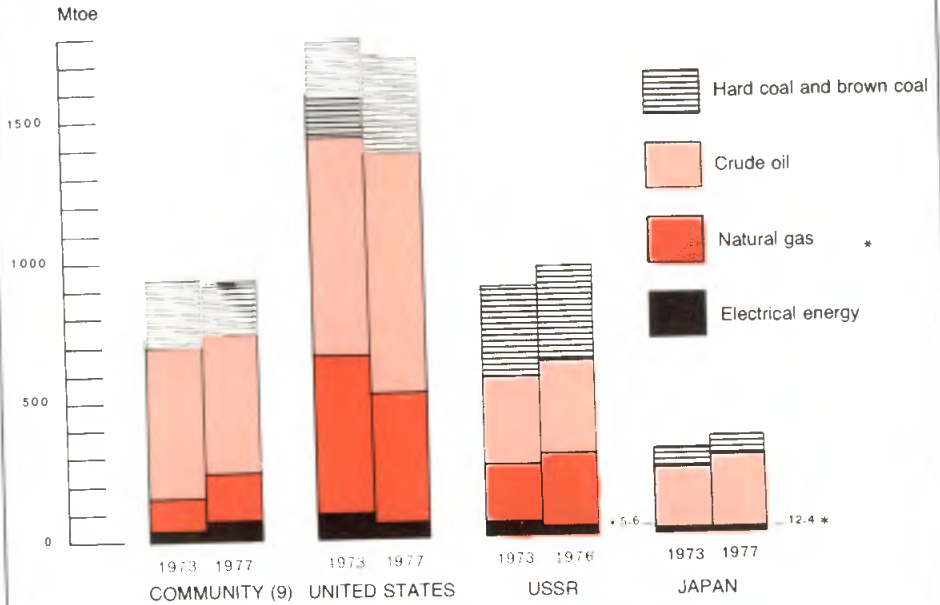
2. Supply structure

This boom in primary energy consumption was accompanied by radical changes in the patterns of supply. Immediately after the Second World War more than 80% of the total energy requirements of the countries which now form the European Community were met by solid fuels (coal and lignite), while oil accounted for only about one-tenth of the total.

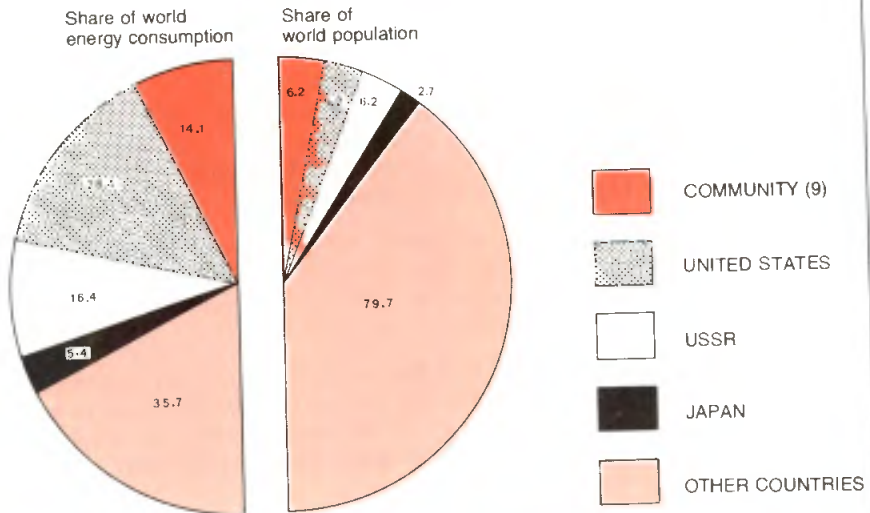
By 1973, however, solid fuels covered scarcely more than one-fifth of total requirements (23%) whereas oil accounted for nearly three-fifths (59%), natural gas — a source recently established in Europe — accounted for over 12%, and hydroelectric, geothermal and nuclear energy accounted for the balance (just over 40%).

It has, therefore, been hydrocarbon fuels (oil and natural gas) that have made the rapid growth in consumption possible. In addition, the uses to which petroleum products are put have been extended considerably. Whereas in the past they were used mainly as fuel, they are now increasingly used to produce heat (heating, furnaces, electricity, etc.) and as raw materials for the petrochemical industry.

SHARE OF THE VARIOUS SOURCES OF PRIMARY ENERGY IN GROSS INTERNAL CONSUMPTION



INTERNATIONAL COMPARISONS (1978 in %)



In 1973 it was generally thought that the pattern of energy supplies would continue to follow much the same trends. According to the forecasts drawn up by the European Commission at the end of 1972:

- solid fuels would continue to decline in importance, their share falling to some 10% by 1985;
- oil and natural gas would increase their share still further, accounting respectively for 64% and 15% of energy requirements in 1985;
- hydroelectric and geothermal energy would be of even less importance, covering only 2% of requirements, while nuclear energy would increase its share from 1.4% in 1973 to some 9% by 1985.

The changing pattern of Community energy consumption has been accompanied by a change in the ratio between energy produced in the Community and imported energy. The Community has always been poor in oil resources and, despite the recent North Sea discoveries, demand for oil has remained markedly higher than international production.

The increase in consumption was covered chiefly by imported oil; consequently, whereas energy imports accounted for scarcely 10% of Community supplies around 1950, they have now come to constitute over 60% of the Nine's total energy supplies. Furthermore, according to the forecasts made before the crisis of 1973, it did not appear that this degree of dependence on external supplies was likely to decrease. The expected contribution from the North Sea, in the form of oil and gas, would have been partly offset by an increase in imports of coal, natural gas and nuclear fuel.

3. *Prices*

During the first half of the period between the end of the Second World War and the advent of the energy crisis, Community energy prices were governed largely by the price of coal — at that time still the largest source of energy. Independently of the systems of aid to the coal industry, which moreover varied widely from one country to another, the general policy was that coal should not be priced out of the energy market and so high price levels for other sources of energy and, in particular, those of imported energy — especially oil — were maintained so as to protect indigenous coal and allow it to compete favourably.

During the 1960s, however, after coal had declined in importance, there was a change of policy, and it became more advantageous to allow imported energy to compete more freely on the energy market — even if this meant increasing aid to coal, accompanied by a planned cutback on production.

From that time onwards, and to an increasing extent, the energy market, particularly within the Community, came to be dominated by the price of oil products.

From 1960 to 1970, however, the world oil market was characterized by an abundance of supplies and, consequently, low and stable prices; it was a buyer's market in which, in real terms, the prices, if anything, tended to fall. Moreover, because it was available at low prices, oil was able to capture the lion's share of the increase in demand.

TABLE I
Share of the various sources of primary energy in gross consumption

(toe : tonne oil equivalent)

	Hard coal and equivalent		Brown coal and equivalent		Oil and equivalent		Natural gas		Other fuels		Electrical energy		Total	
	1973	1978	1973	1978	1973	1978	1973	1978	1973	1978	1973	1978	1973	1978
FR of Germany	59.6 22.4	49.7 18.3	23.6 8.9	24.6 9.1	145.9 55.0	140.9 52.0	27.4 10.3	42.3 15.6	0.7 0.3	1.0 0.4	8.3 3.1	12.5 4.6	265.6 100	271.0 100
France	27.8 15.5	28.7 15.6	0.9 0.5	1.0 0.5	123.6 68.8	111.5 60.7	13.7 7.7	19.6 10.7	0.1 0.1	0.1 0.1	13.2 7.4	22.7 12.3	179.5 100	183.6 100
Italy	7.7 6.0	8.2 6.1	0.4 0.3	0.3 0.2	95.3 74.6	92.6 68.3	14.5 11.3	22.4 16.5	0.3 0.2	0.2 0.1	9.7 7.6	11.8 8.7	127.7 100	135.5 100
Netherlands	3.2 5.1	3.3 5.1	0.0 0.1	—	29.3 47.7	27.0 41.7	29.0 47.2	33.2 51.2	0.0 0.0	0.3 0.5	-0.1 -0.1	1.0 1.5	61.4 100	64.8 100
Belgium	11.7 25.1	10.5 22.8	0.0 0.0	—	27.5 59.3	24.6 53.5	7.3 15.8	8.7 18.9	0.0 0.1	—	-0.1 -0.3	2.2 4.8	46.4 100	46.0 100
Luxembourg	2.5 48.7	1.8 40.0	0.0 0.4	—	1.8 32.9	1.4 31.1	0.2 4.4	0.5 11.0	1.1 0.1	—	0.6 13.5	0.8 17.9	5.1 100	4.5 100
United Kingdom	80.7 36.2	70.0 33.5	—	—	108.2 48.6	91.8 44.0	25.6 11.5	36.9 17.7	—	—	8.2 3.7	10.1 4.9	222.6 100	208.8 100
Ireland	0.6 8.2	0.6 7.6	0.8 11.4	1.0 12.7	5.5 77.8	6.0 75.9	—	0.1 1.3	—	—	0.2 2.6	0.2 2.6	7.1 100	7.9 100
Denmark	2.3 11.5	3.5 17.1	0.0 0.1	—	17.3 88.6	16.2 79.0	—	—	—	—	-0.0 -0.2	0.8 3.9	19.6 100	20.5 100
Community (9)	195.9 21.0	176.3 18.7	25.8 2.8	26.9 2.9	554.4 59.2	512.0 54.3	117.8 12.6	163.4 17.3	1.1 0.1	1.7 0.2	40.0 4.3	61.9 6.6	935.0 100	942.3 100

Source : Eurostat

During this period, the Community benefited from the active competition which prevailed on the oil market and, consequently, on the energy market as a whole: it was indeed possible for the Community to secure its energy supplies at very advantageous prices, as oil was able to cover the increase in demand at low prices and thus influence the price of other energy sources.

But the relative fall in prices also had the effect of speeding up the cutback in coal and of slowing down the development of nuclear energy.

4. Effects within the Community

The Community's energy supply pattern has therefore undergone a change, the major features of which have been a drop in the relative importance of solid fuels, greater use of liquid and gaseous fuels and increased dependence on imported fuel, principally oil.

This change has had important results within the Community.

First, it has brought closer together national situations which had previously differed fairly widely. Among the countries now belonging to the European Community, a distinction used to exist between, on the one hand, the energy-producing countries (i.e. mainly those producing coal) such as the United Kingdom, the Federal Republic of Germany, Belgium, France and (to a lesser extent) the Netherlands, and, on the other, the mainly energy-consuming countries of Italy, Denmark, Ireland and Luxembourg. This distinction was somewhat blurred, as the producing countries were already importing energy — particularly oil — while some consumer countries could rely on a certain amount of national production (hydroelectric power, peat and so on). Nevertheless, a real distinction did exist some twenty years ago, and influenced consumer behaviour.

As a result of the cutback in coal production which affected all the producing countries, albeit to differing extents, and the constant increase in demand which reduced the relative share of internal energy sources, all the Community countries became net importers of energy — the amount varying in 1973 between half their supplies and almost their entire requirements.

Furthermore, the shift from coal to oil has had an impact on the regional distribution of industry within the Community. Originally based in the coalfields, industry was still, immediately after the Second World War, concentrated mainly in the coal-producing central areas of north-western Europe. Oil, which was imported mainly by sea, reached Europe and the Community via the seaports. Related activities (e.g. refining) and those attracted by the difference in transport costs (petrochemicals and various other industries) have therefore provided opportunities for industrial development in coastal regions. At the same time, the cutback in coal production has given rise to problems in regions where coal-mining was an important activity or which were the traditional centres of important consuming industries.

Finally, the oil-refining industry has developed its operating installations in step with the sustained growth in demand for petroleum products. The early action required in respect

of investment projects with lead-times running into several years was to give to an aggregate capacity which was very large even before the crisis; once the crisis had arrived, this capacity proved very much in excess of needs, thus threatening the viability of the refining industry.

5. Worldwide effects

The change in the energy supply pattern has also had considerable international repercussions.

In the first place, the discovery of large, easily-extracted deposits of low-cost oil in the Middle East led to a ready availability of cheap oil supplies during the period 1960-1970. However — and this illustrates the influence of purely political factors — the decision taken by President Eisenhower in 1958 to restrict imports of crude oil into the United States led to the greater part of available resources in the Middle East being diverted towards Europe and Japan, making these great industrialized regions largely dependent for their supplies on a small number of countries located in or around a politically and militarily unstable zone. Thus the shift towards oil had major repercussions on the strategic situation and geopolitical on a worldwide scale.

In the economic context, the world oil industry has also undergone profound change. Until some twelve years ago, the major international oil companies, which because of their highly integrated structure control all activities connected with oil (prospecting, production, transport, refining, storage and distribution), were still in a position to regulate the volume of oil production and the conditions for marketing for the great majority of exporting countries and most of the importing countries.

This position has gradually changed as a result of action taken both by the governments of the oil-exporting countries and by those of certain importing countries.

In 1960, for example, the Organization of Petroleum Exporting Countries (OPEC) was set up and, by coordinating the action of those countries, strengthened their position. As far back as 1965, as the earliest concrete manifestation of this new development in the balance of strength, the Libyan Government, using the threat of an imposed cutback in production, brought about a change in the fiscal arrangements applying to concession companies operating within its territory.

It was in this way too that, in certain importing countries, mainly in Western Europe, the public authorities aided the creation or expansion of national petroleum whose integrated activities, including production and marketing, were to extend far beyond the borders of their countries of origin.

Lastly, these changes have had repercussions on the inter-relationships between the United States on the one hand and Europe and Japan on the other, and also on their relationships *vis-à-vis* the rest of the world.

The United States are able to satisfy almost all their energy needs from domestic production, or at any rate from the American continent, so that for a long time the country has enjoyed price advantages over its industrial competitors. American coal has always benefited from very favourable mining conditions, and Europe used to obtain oil mainly from Venezuela at prices based on the cost to the United States plus the cost of transport.

But from the moment when Europe was able to draw increasing supplies from the Middle East and North Africa — regions which are much closer to Europe than to the United States and have low production costs — the situation was bound to be reversed gradually. Japan also benefited from this trend, and in their turn the two major regions which are the industrial competitors of the United States were able to take advantage of lower energy prices. This inevitably had an impact on competitive conditions between the United States on the one hand and Europe and Japan on the other, and also influenced economic, financial and monetary developments.

Particularly towards the end of the 1960s, Europe and Japan thus had a more rapid and more sustained economic development than the United States.

6. Background to the crisis

The situation in fact began to change towards the end of 1969. At that time the world demand for energy, especially oil, was increasing at a constant rate and rather more rapidly than the producing companies had foreseen. A poor level of investment in some areas — particularly transport — together with difficulties and delays in the development of new resources, especially for environmental reasons (e.g. Alaska), combined with a high level of demand from Europe and Japan and expanding purchases by the United States, turned a buyer's market into a market on which it is the sellers who impose their conditions.

The exporting countries, grouped together under the banner of OPEC, realizing the advantage to be gained from this new situation, pursued a concerted policy to obtain simultaneously an increase in their oil revenues, certain guarantees to maintain the real value of these revenues and, in short, greater control of the economic management and exploitation of their oil resources, with a view to achieving the most efficient operation possible.

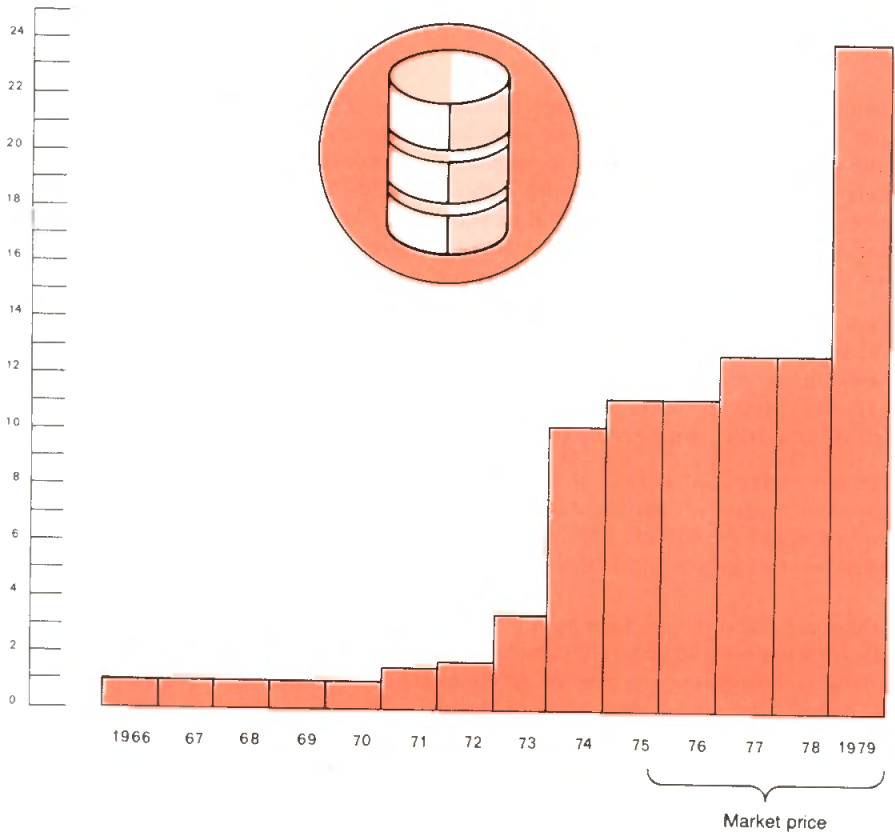
In economic terms, oil is both a source of revenue (often almost the only one) and a development instrument for the exporting countries. Among the exporting countries of North Africa and the Middle East, which together supply about 80% of the Community's imported oil, two groups must be distinguished.

First there are the countries such as Algeria, Iran and perhaps Iraq which, because of their population structure and geography, have an assured potential for agriculture and industrial development. In these countries, oil revenues are invested mainly in infrastructures and in capital goods purchased from Europe or America.

The other countries can do little but invest their oil revenues abroad, and these investments, for the most short-term, constitute floating masses of capital which — because of their constant growth and considerable mobility — at least help to accentuate, if they do not sometimes cause, alarming monetary fluctuations.

Whichever category they belong to, these countries have an interest in protecting their revenue from losses in real value and purchasing power brought about by inflation. Some exporting countries have, moreover, wondered whether they should reduce the rate of increase of their production in order both to husband reserves — which, though very substantial in the Middle East, are not inexhaustible — and to allow the capital represented

DEVELOPMENT OF CRUDE OIL PRICES
Average crude oil price for producing companies
(Arabian Light 34° API — dollars per barrel)



by this oil to appreciate in value underground to a greater extent and at a faster rate than the same capital would if invested anywhere else.

Action taken by the exporting countries since 1970 has reflected these three legitimate concerns and has given rise to the 1971 Teheran and Tripoli agreements on price increases, a number of agreements on price adjustments after major currency fluctuations, the 1972 New York and Vienna agreements on participation and also several nationalization measures.

II Impact of the crisis

1. Cause and recent trends

However, certain oil-exporting countries added political considerations to the purely economic demands. The ongoing tension and periodic armed conflicts which are features of Arab-Israeli relations led the Arab countries to regard oil as a weapon and to use the interruption of deliveries as a means of exerting political pressure. This happened in October and November 1973.

However, as far as energy is concerned, the most significant effect of these events was to give a sharp boost to the trend that had been in evidence since the end of the 1960s.

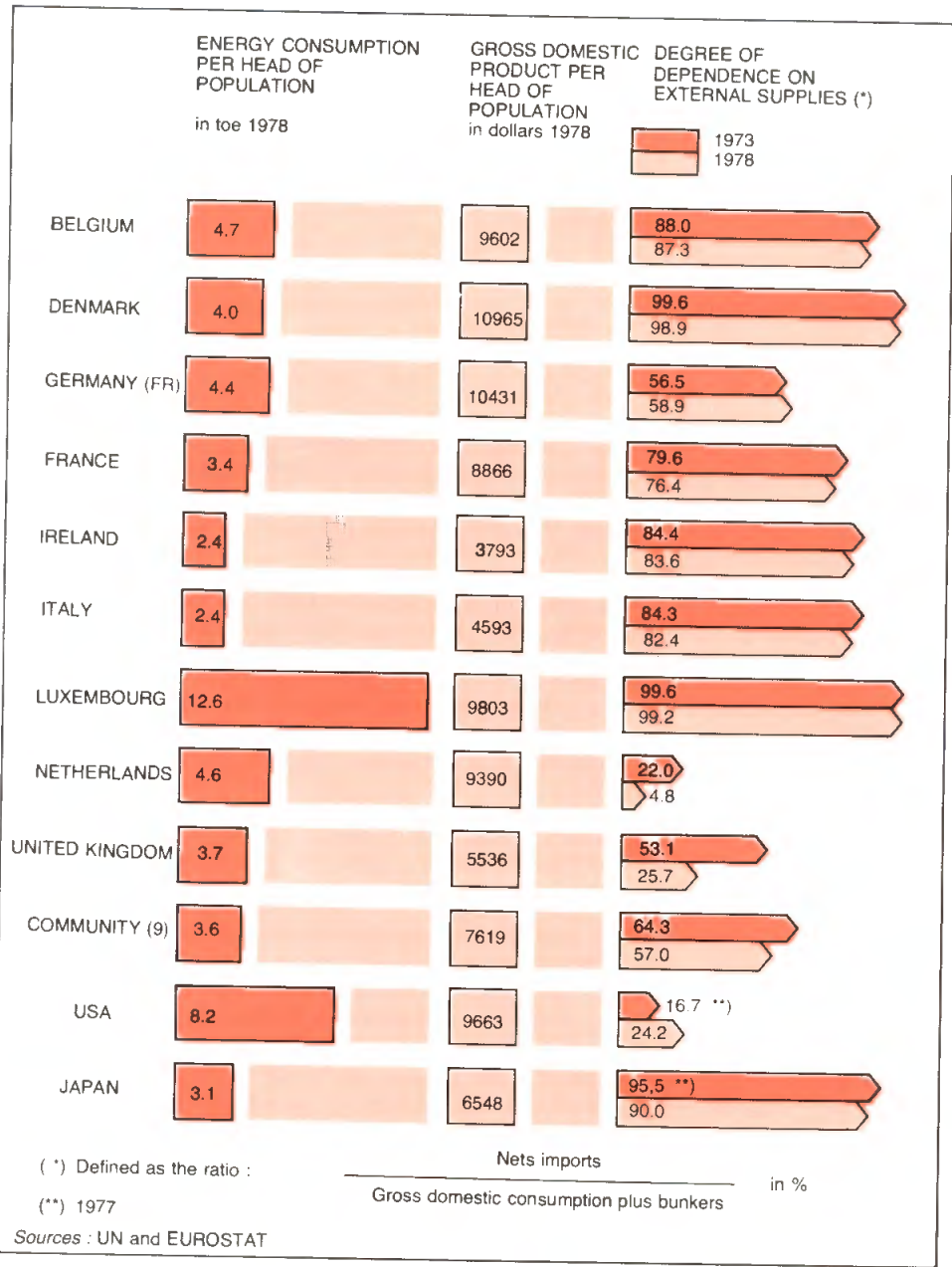
In December 1973, the exporting countries stopped fixing crude oil prices by agreement with the oil companies and decided that in future they would determine the level of these prices unilaterally. Crude oil prices immediately tripled, then increased again shortly afterwards so that in January 1974 the price of crude oil exported from the producing countries was over four times what it had been in 1973.

Simultaneously, the producing countries became more determined to take over completely the management of their oil resources; this has been achieved in the majority of cases.

We shall see that the abrupt rise in crude oil prices has had serious effects on the level of economic activity. These effects, in their turn, have restricted energy consumption. This trend, coupled with the measures taken to save energy and reduce imports ensured for the Community a relatively secure supply situation up to the end of 1978. The general rate of inflation and the devaluation of the dollar cushioned the effect of the oil price rise, bringing it to and maintaining it at a level equivalent to or even lower than that of January 1974 in constant prices, despite further rises. None the less, the world oil market became tense again in 1979. In the first six months of that year, the crisis in Iran resulted in a supply shortfall, which first caused speculative price increases. The Organization of Petroleum Exporting Countries (OPEC) then decided to increase crude oil prices, further raising them in stages to an average in 1980 of double the December 1978 level.

2. Reactions of the oil-consuming countries

As a result of the situation provoked by the oil crisis, the President of the United States held a conference in Washington in February 1974; those taking part included — in addition to



the Community as such and all its Member States — the United States, Canada, Japan and Norway.

Thereafter, however, France, which had expressed certain reservations with regard to the guidelines adopted, did not take part in the Energy Coordination Group set up by the conference. The work of this Group led, on the one hand, to an international agreement on energy and, on the other, to the establishment of the International Energy Agency (IEA) within the framework of OECD.

In essence, this agreement covers a vast programme of cooperation which includes:

- ensuring, in the event of oil supply difficulties, common measures to restrict demand and measures for the sharing of all available oil;
- the establishment of an information system covering the international oil market;
- the establishment and implementation of a programme of long-term cooperation, with the object of reducing dependence on oil imports;
- the encouragement of cooperation with the producing countries and with the other oil-consuming countries.

Although it was not associated with the work of the Coordination Group, the Commission of the European Communities was consulted as to its results, and stressed the need for all Member States, whether or not they were parties to the agreement, to formulate a common energy policy rapidly and in specific detail. Moreover, it insisted that the Member States which were parties to the agreement should take the requisite measures to ensure that the solidarity of the Community and the rules of the Treaties should be respected in the event of the supply-sharing system envisaged by the agreement being implemented.

Although the Community as such is not a member of the International Energy Agency, the Commission of the European Communities has been participating in its work since the end of 1974, fulfilling a dual role of coordination, on the one hand with regard to the views of its Member States and on the other with regard to the action of the Agency and that of the Community.

The work carried out by the Agency comprises, in particular:

- establishment and implementation of a programme of long-term cooperation on the development of resources and economical use of energy, including energy R & D;
- examination of national programmes for energy conservation, including the development of new sources or new sources;
- improvement of the information system covering the oil and gas markets;
- creation of a statistical data centre for energy;
- establishment of a mechanism for the restriction of demand and the sharing of oil resources in the event of supply difficulties.

Progress towards agreement and cooperation between the energy-consuming countries largely depends on market trends: efforts slacken when the difficulties diminish, only to re-intensify when the situation again turns critical. The tensions which reappeared in 1979 have, however, led to one advance: at their summit meeting in Tokyo in June 1979 the Heads of State and Government of the United States, Canada, Japan and the European Community agreed on a common strategy to restrict oil consumption and accelerate the

development of other energy sources. In practical terms, these countries have committed themselves to maintain their oil imports for the next five years at the 1978 or 1979 level, to practice a realistic oil-pricing policy, to promote energy savings, to encourage the production and utilization of coal and, finally, to take coordinated measures to develop those energy sources which can serve as alternatives to oil.

3. Effects on the world economy

The oil crisis was followed by the most serious economic recession since the war.

The oil crisis is only partly responsible for this recession, but differences in the economic policies and in the behaviour of the economic operators of the oil-importing countries, in particular the Community countries, have obviously appreciably increased the adverse effects of the oil price rise on economic trends.

The sharp increase in oil prices at the end of 1973 strongly stimulated inflation throughout the world. Within the European Community, the average annual rate for the last five years has been around 11%. However, the situation differs markedly from one country to another, the extremes being represented by the Federal Republic of Germany, with an annual rate of 4.8%, and the United Kingdom, Ireland or Italy, with annual rates of 15-20%. At all events, inflation on this scale and above all the measures taken to combat it, are incompatible with a regular and sustained economic expansion.

The quadrupling of oil prices also helped to convert the traditional balance-of-payments surplus of the industrialized countries into a deficit, and to aggravate the already large deficit of the developing countries that were not oil producers. The beneficiaries of the trend were, quite evidently, the OPEC countries: the scale of their new-found wealth can be gauged from the fact, after satisfying all their own requirements — it was pointed out above that the situation in this respect varies greatly from one country to another — but the accumulated surplus of their current balances over the period 1973-1978 reached 165 000 million dollars and that this surplus should rise to around 50 000 million dollars in 1979. These vast amounts have thus been withdrawn from the funds available to stimulate international trade. Apart from the fact that the — mainly short-term — investment of these funds has given rise to serious monetary fluctuations which have also had a restrictive effect on the exchange of goods and services, the existence of this imbalance in the balance of payments has led to a decline in world trade, which dropped by 4% between 1974 and 1975. A decline of this type obviously starts a chain reaction, the reduction in exports leading to a drop in industrial activity and thus a reduction in imports which, once again, affects world trade.

The transfer of wealth provoked by the increase in oil prices has had other effects. The amount thus siphoned-off by the oil-exporting countries from the revenue of the importing countries has affected the spending of the citizens of these countries and their savings, i.e. their standard of living and rate of capital formation, and also consumption and investment.

In addition to the 'price effect' — a direct increase in the prices of imports and an accompanying rise in production costs — there is therefore a 'revenue effect' in the form of a net transfer to the oil-exporting countries. Although some of these countries have to some extent re-lent, through their investments to certain industrialized countries which were their

principal customers, a proportion of the sums which the latter had to raise to pay the enormous cost of their oil imports, this does not affect the fact that the reduction in current spending and investment in these countries has affected their level of industrial and economic activity.

For instance, within the European Community industrial production dropped by 8% between 1974 and 1975. Moreover, the overall gross domestic product declined by 2.2% during the same period, whereas ever since the war it had maintained a continuous and sustained rate of growth. Even though there was some recovery at the beginning of 1976, there has no longer been satisfactory expansion with regard to employment needs.

This trend has been accompanied by a rise in unemployment, and the number of unemployed increased from some 3.5 million at the end of 1974 to 5 million in 1975 and then continued to rise, reaching and exceeding 6 million.

As far as the Third World countries which are not oil producers are concerned, their situation has become extremely critical, because their foreign debt burden, which was already very high, has been almost doubled by the increase in the price of an energy source which constitutes an essential element of their economic development.

The deficit in their current balances — cumulated over the period 1973-1978 — amounts to some 150 000 million dollars, and could reach 45 000 million in 1979. Compared with the previously-mentioned figures for the OPEC countries' surplus, it will be seen that it is largely the Third World which shoulders the burden.

Finally, the increase in oil prices has had yet another effect: the European Community and Japan have now lost the competitive advantage that they had over the United States when they were able to obtain a large proportion of their energy supplies on the world market at prices lower than those of domestic resources.

4. The Community and the new factors governing the energy market

The economic recession and the changes in energy prices have not been without repercussions on energy consumption.

Within the Community, gross consumption of primary energy has shown the following trend (million tonnes oil equivalent — toe):

1973: 971	1977: 946
1974: 946	1978: 972 (provisional)
1975: 894	1979: 1 015 (estimated)
1976: 946	1980: 1 030 (forecast).

This has been an exceptional phenomenon, and one which previous experience since the Second World War made it absolutely impossible to predict. There has, in fact, been a decrease in energy consumption for two consecutive years, whereas between 1950 and 1973 consumption rose uninterruptedly from year to year. An average and relatively constant increase of 4.5% per annum ceased abruptly, and was followed by five years of stagnation.

This trend is explained partly by the decline in economic activity — particularly industrial activity. It was noted that the latter fell by 8% between 1974 and 1975, and that even now

recovery is only half-hearted. The trend is also explained by reactions to the oil crisis itself. In 1974 it was, above all, physical factors which played a part: the interruption of supplies to some countries and the measures taken by certain governments to impose a reduction in consumption. Thereafter, the additional factor to be taken into consideration is the effect of the price increase which, at least momentarily, caused consumers to moderate their consumption somewhat. Moreover, measures to encourage more rational use of energy began to have an impact.

The trend of recent years has led to a downward revision of energy consumption forecasts for the coming years.

Whereas, as early as 1974, the gross domestic consumption of primary energy forecast for the Community for 1985 was reduced from some 1 800 mtoe to around 1 450 mtoe, it now appears that it will hardly reach 1 200 mtoe, rising to some 1 350 mtoe in 1990.

It is true that these new forecasts of trends in demand reflect a sustained effort to achieve energy savings and more rational use of energy. It is also evident, however, that the stagnation of demand between 1973 and 1978 has caused a downward shift of the curve. During the coming years, the hoped-for economic upturn would lead to a fresh increase in energy consumption if no effort were made to utilize it more rationally.

III A common energy policy

Even before the outbreak of the energy crisis the Community had attempted to formulate and to implement a common energy policy. However, the measures forced upon the governments of the Member States by the threatening situation of late 1973 and early 1974 were conceived and adopted haphazardly and without much coordination or solidarity, which reduced their effectiveness and endangered the process of building Europe.

On the other hand, it is now more apparent than ever that the convergence of national policies and the creation of a common energy policy are fundamental factors in the creation of European unity, and that the measures to be taken inside the Community and also the positions to be adopted on the international scene will carry far more weight and be far more effective if they are taken jointly on behalf of a group of industrialized countries with 250 million inhabitants than if they are the outcome of separate and discordant policies.

1. The first steps towards the first achievements

The Community has been working towards a common energy policy for a long time.

Even though there is no mention of such a policy in the European Treaties, a working party on energy adopted, in June 1962, a memorandum on energy policy which was designed to achieve the free circulation of energy within the Common Market and which included detailed provisions regarding the diversification of external supplies, aid to Community production (principally that of coal), the rapid development of nuclear energy, storage, taxation and import regulations. This memorandum constituted, in fact, the first outline of a real energy policy for the Community.

Thereafter, further efforts were made by the European Commission, which in December 1968 submitted to the Council of Ministers its 'First guidelines for a Community energy policy'. This was followed by two Communications: 'Necessary progress in Community policy' (October 1972) and 'Guidelines and priority actions for Community energy policy' (April 1973). These last two programmes defined more closely the problems caused by the new situation on the world energy market.

The oil crisis and its implications were examined at the Summit Conference held in Copenhagen on 14 and 15 December 1973. It was agreed that the Community needed to take effective measures for an energy policy immediately, and to facilitate its formulation and implementation it was decided to create a new body — the Energy Committee. Composed of representatives of the Member States, under the chairmanship of a member of the Commission, the Committee is responsible for ensuring the coordinated implementation by Member States of the measures adopted by the Community, providing for the exchange of information and consultation between Member States and the Commission with regard to supply conditions and foreseeable developments in the supply situation, and also assisting the Commission in the formulation of its proposals.

In May 1974 the Commission submitted to the Council a Communication based on the current situation and entitled 'Towards a new energy policy strategy for the Community'.

The Commission also proposed to the Council objectives for the Community's supply structure in 1985 which were approved in December 1974. A set of concrete proposals and a series of general or sectoral communications formulated to suit the observed developments were put forward as an aid to achieving these objectives.

The tension which reappeared in 1979 and the difficult and irregular progress towards the objectives for 1985 prompted the Commission to take stock in June 1979 in a communication to the Council entitled 'Energy objectives of the Community for 1990 and convergence of policies of the Member States'. Finally, the new objectives were specified in an 'Energy programme of the European Communities' drawn up in October 1979.

It should also be noted that, since the crisis began in 1973, these energy problems have appeared on the agenda of all the European Councils, the summit meetings of the Heads of State and Government of the Community countries.

2. The fundamental options

The guidelines for an energy policy proposed by the Commission were based on certain fundamental options.

In the first place, it was recognized that assuring the Community's short-, medium- and long-term energy supply now constitutes a major problem which cannot be solved simply by voluntary or imposed curbs on the consumption of energy finally made available to agricultural, industrial, commercial or domestic consumers.

It is, in fact, clear that people's legitimate aspirations to achieve an improvement in the 'quality of life' is not, at the moment, accompanied by any willingness to renounce the 'quantity' of goods and services which they wish to have.

The desire to ensure a supply of energy which will make it possible to pursue economic growth and social progress is, however, perfectly reconcilable with the objective of reducing the difference between the quantities of primary energy introduced into the economic circuit and the quantities of useful energy made available to the consumer. To achieve this, it is essential not only to make vigorous efforts to save energy and improve energy efficiency but also to develop new energy sources.

In the past, a close relationship has been observed between economic growth and energy consumption. This relationship must be ended if it is intended to carry into the future an economic growth which is compatible with the prospect of dearer and less abundant energy supplies.

The work of a group of experts asked by the Commission to examine the implications of more rapid progress towards an energy-efficient society showed that gradual dissociation between economic growth and the growth in energy consumption is possible and that our societies are able to meet the energy challenge without jeopardizing the values, traditions, economic well-being and social progress which its members desire.

Energy must be supplied in sufficient quantity, but must also be available at favourable and stable prices, in secure conditions. As far as possible it must be free from possible threats of interruption of deliveries or arbitrary and drastic price increases. It is, therefore, necessary to seek to achieve a high degree of independence at acceptable prices.

This implies that efforts should be made to make the most of the internal resources of the Community and of those which are characterized by a high degree of security of supply. It also calls for the development of new energy sources or of new techniques of extraction, recovery, conservation, utilization, etc.

However, it must be borne in mind that no innovation and no existing procedure is exempt, in its technical, economic, ecological or financial aspects, from uncertainties, obstacles and risks which cannot all or always be foreseen.

But two extreme attitudes must be avoided: on the one hand, blind faith in science's ability to find a satisfactory solution — a 'technical fix' — in good time; and, on the other hand, opposition to new techniques as long as the uncertainties have not been completely eliminated and the risks entirely avoided. The result would be paralysis, stagnation and even perhaps a regression which would jeopardize the results achieved so far, hamper development and finally lead to an economic and social decline with repercussions which might be more serious than those of using new techniques.

The sensible and only acceptable attitude consists in making a sustained effort of research, development and promotion devoted to the various promising techniques and, among these, primarily to those which present the least risks and to those which consume the smallest amount of the valuable and limited resources available for mankind's use. It is also important that, in addition to bringing a new technique to the stage of development, this research should also be devoted to identifying the short or long-term risks and dangers and to finding solutions thereto. As far as possible, energy policy must therefore take into account the desire to protect the environment and conserve resources.

The trend towards more satisfactory energy supply for the Community must also be directed at diversification, and no one source or form of energy should be allowed to enjoy a position

of monopoly or quasi-monopoly. The leading position of coal and the great importance of oil must not be replaced tomorrow by any other equivalent dominance by, for example, nuclear energy. In future, all economically exploitable sources and techniques can and must play their part, in a balanced situation which will develop with time, in accordance with their individual characteristics and merits.

It must also be borne in mind that these research and development efforts and this requisite diversification, even though they may contribute to reducing dependence on external supplies, will not lead to a more or less complete self-sufficiency.

It is, moreover, essential to maintain a place for energy in international trade. Some energy sources, particularly oil, constitute for the countries that produce them an important resource, and sometimes almost the only one. Those countries which cannot put it to profitable use on their own territory find in its export their sole or principal means of subsistence and development.

It is therefore necessary to ensure the establishment between the importing and the exporting countries, which are closely dependent on each other, of a system of mutually profitable economic and financial relationship guaranteeing, on equitable and stable terms, essential supplies of energy to the former and the financial and technical means of development to the latter.

These options already formed the basis of the 'New strategy' of 1974. They have also continued to dictate the communications and proposals which the Commission has drawn up since. Implicitly or explicitly, they also remain the basis of the 'Energy objectives for 1990' and the 'Energy programme of the European Communities' drawn up in October 1979.

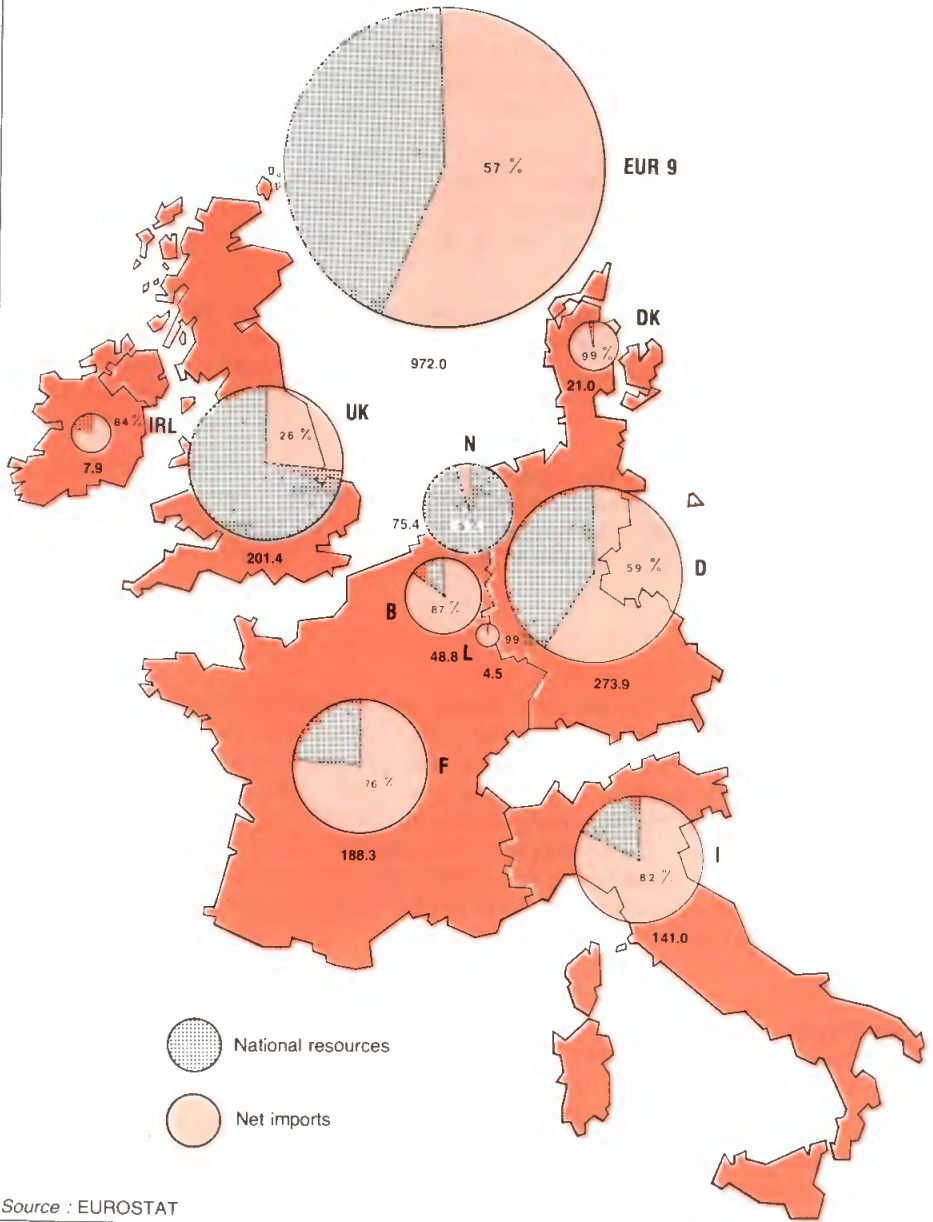
3. Medium-term aims

The Commission considered, in the circumstance, that the time had come to set out specific objectives for a Community energy policy rather than simply make forecasts for the future. It first of all submitted to the Council, which adopted them on 17 December 1974, objectives for the Community's supply pattern for 1985. The main aim was to reduce dependence on imported energy, which stood at 61% in 1973, to about 50%. This would make for greater security of energy supplies and reduce the burden which the increased price of imported energy had placed on the economy and on the balance of payments. The overall pattern of demand for primary energy in 1985 would then look like this, as compared with the earlier forecasts:

— solid fuels	17% instead of 10%
— oil	47% instead of 64%
— natural gas	20% instead of 15%
— hydroelectric and geothermal energy	3% instead of 2%
— nuclear energy	13% instead of 9%

Thus, oil imports would be reduced by maintaining coal production at current levels, and encouraging the development of other sources of energy and a more rapid development of nuclear energy as a source of electricity. Finally, and this is another important aim, these proportions would apply to a volume of consumption substantially reduced by a more efficient use of energy.

ENERGY DEPENDENCY (1978)
mtoe



Source : EUROSTAT

Since 1974, the situation has in fact developed in this direction.

Energy consumption did not increase between 1973 and 1978 whereas the gross domestic product increased in volume by 10.7%. This trend is partly explained by energy savings; it is estimated that such savings resulted in consumption being 7-8% lower than it would otherwise have been in the 1975-77 period and as much as 10% lower in 1978 and 1979.

Some progress has been made in reducing dependence on external supplies, which has dropped from 63% in 1973 to 55% in 1978. The proportion of total energy consumption accounted for by oil dropped from 61% to 55% over this period and may go down to 50% in 1985. Natural gas also appears likely to meet the targets set while coal will fall a little short. Nuclear energy programmes, however, are behind schedule and, at 70-80 GWe in 1985, installed capacity will be less than half the target figure.

These various trends affect oil imports which, although they dropped by almost 20% (109 million tonnes) between 1973 and 1978, will in 1985 still be higher than the target proposed and, in particular, the ideal figure.

The current situation, as we have seen, remains alarming. Although the quantitative difficulties of the first half of 1979 have been overcome, the oil market prospects are not reassuring.

As regards quantities, it appears that the exporting countries are intent on maintaining their incomes without increasing production, or even reducing it to a certain extent: production in the OPEC countries may never again exceed the production of recent years and could settle permanently below this level. In 1985 world demand for crude oil from the OPEC countries could exceed production by 150 million-200 million tonnes and thus obviously reinforce the upward trend.

Within OPEC, the hard line calling for maximum price increases and a reduction in the volume supplied could, it seems, overcome the more conciliatory line which is reluctant to ruin the prosperity of the industrialized countries and the development of the Third World.

The successive price rises posted by the exporting countries for their crude oil have been further reinforced by the far greater increase in prices on the spot market, mainly operating in Rotterdam, and the growing use which the OPEC countries make of this market.

Future prospects, as much as recent events, thus confirm the validity of the guidelines behind the targets adopted in 1974. But the 1985 deadline is approaching and — as the effects of policy options and energy investment do not make themselves felt for around ten years — decisions now or in the near future will hardly affect 1985 but will instead determine the Community's energy situation around 1990.

In June 1979 the Commission therefore drew up a set of recommendations for new targets for 1990. The prospects of enlargement indicate that the Community of 1990 will no longer be the same as it is today: Greece and subsequently Portugal and Spain will doubtlessly have joined the nine current Member States by then. The new objectives are, however, in keeping with this situation: the economic and energy structure of the future member countries is perhaps even more sensitive to the consequences of adverse trends on the world oil market than that of the current Member States. Efforts to ensure convergence and progress towards a common policy will therefore be essential for the new countries too.

The redrafted objectives recommended for 1990 are as follows:

- (a) Reduction of the ratio between economic growth and growth in energy demand: it should be possible to reduce this ratio, which has for a long time been around 1, to 0.8 in 1985 and 0.7 in 1990. This requires the Community-wide implementation of all the practically feasible and economically justifiable energy-saving techniques and the search for and application of new ways of saving energy.
- (b) Reduction to 50% of the Community's dependence on energy imports. This will result not only from energy savings but also from the maximum development of internal resources.
- (c) Restriction of oil imports to the level of 1978, i.e. 470 million tonnes. Oil savings, the substitution of other fuels, restricting use to sectors like road transport which specifically require petroleum products, optimum development of Community production and intensification of prospecting in the Community to guard against any reduction in production after 1990 could all help maintain imports at their current level.
- (d) Increased use of solid fuels and nuclear energy in power stations so that these primary energy sources together account for 70-75% of electricity generation.
- (e) The restoration of Community coal production to the 1973 level, i.e. 250 million toe (initial objective for 1985). At the same time, coal imports must be raised and the Community's capacities for consuming solid fuels increased.
- (f) Assistance for nuclear power station construction programmes to avoid any further delay, the improvement of conditions for supplying nuclear fuels and the solution of safety problems.
- (g) The establishment and application of rational and transparent price policies.
- (h) The search for, development of and demonstration of new energy sources. These various recommendations form part of the Community's three basic objectives:
 - (i) dissociation of economic growth and growth in energy consumption;
 - (ii) levelling out of oil imports;
 - (iii) preparation of a more satisfactory energy supply for the more distant future.

4. Energy policy instruments

Among the instruments needed for the formulation and implementation of an energy policy, the most important are information and knowledge of trends in the energy market and the oil market in particular, about which both the majority of the Member States and the Commission possessed hardly any data.

As long ago as 1972, the Council adopted measures designed to give the Commission — in addition to the information of this kind compiled for the coal and nuclear sectors as a result of the ECSC and Euratom Treaties — information on planned investment in the oil, natural gas and electricity sectors.

About the same time, a system was also established for compiling information on imports of crude oil and natural gas in each six-month period and also, at the end of each year, on those

forecasts for the following year. After the events of late 1973, the Commission requested the Member States to provide this information quarterly, broken down by company, in order to make it possible to evaluate the supply situation with the degree of accuracy which the circumstances made necessary. In 1974, the Council approved two regulations stipulating notification to the Commission of both imports of oil products and exports of hydrocarbons (crude oil, petroleum products, and natural gas). With the body of data forming the basis of regular reports to the Council, the public authorities of the Community now possess complete information regarding trade in hydrocarbons between the Community and non-member countries.

The Council also later adopted a directive establishing a procedure for information and consultation with regard to the prices of crude oil and petroleum products in the Community. These new Community rules will make it possible to improve transparency with regard to the market costs and prices of petroleum products. On the basis of the information compiled in this way the Commission prepares and communicates to the Member States, every quarter, summary data on the price of crude oil and petroleum products, as well as a comparison of costs of oil supplies and ex-refinery revenues. These communications form the basis of consultations between the Member States and the Commission regarding market trends: such consultations should make it possible to correct unjustified variations in prices and to harmonize decisions to be taken by individual countries.

The Commission is also able to obtain this information more rapidly when necessary.

Because of the alarming development of the situation the monitoring of oil imports was stepped up in the second half of 1979 by subjecting transactions to registration providing information about the conditions in which they are conducted.

Finally, in November 1977, the Governments of the Member States decided to compile information on coal imports from non-member countries and forward it to the Commission.

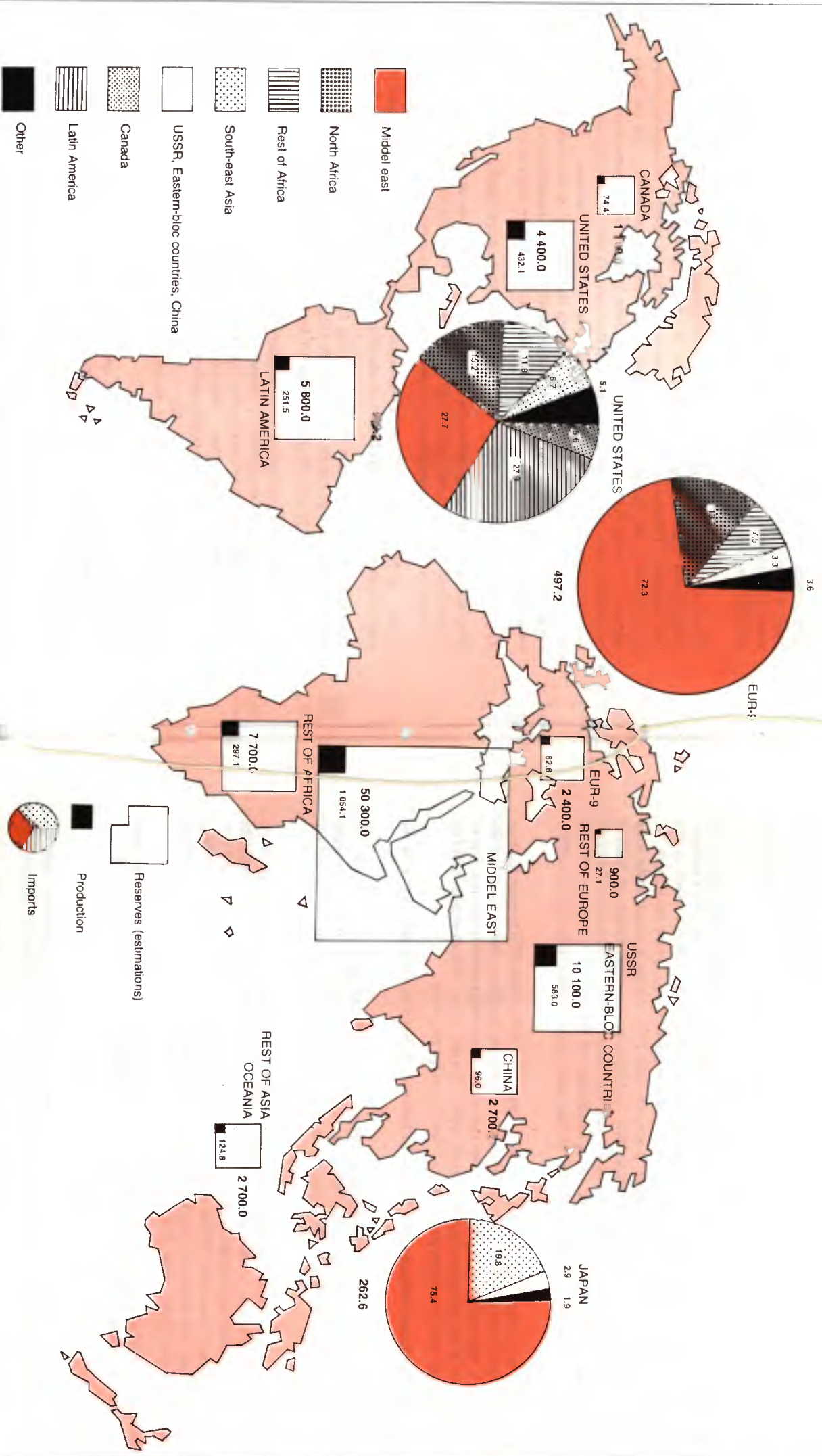
The coal monitoring system plus the nuclear fuel monitoring carried out by the Euratom Supply Agency set up under the Euratom Treaty means that information available to the Community now covers the entire range of fuels.

In the view of the Commission, the compilation of information on facts and trends is clearly not an end in itself; its essential purpose is to enable concerted action to be taken by the national public authorities and by the Community institutions to ensure the implementation of common political guidelines. Moreover, as regards both trade and prices this concerted action is not confined to the public authorities, for the Commission is in constant touch with the trade sectors, and in particular with the oil companies which supply the Community, with the major transport and gas distribution industries and with coal and electricity producers.

In addition, the Commission, with the agreement of the Council, has organized a procedure for the reciprocal exchange of information at Community level on the siting of power stations. The Commission has also proposed the introduction of a Community consultation procedure for power stations liable to affect the territory of another Member State.

The implementation of an energy policy also entails measures of direct intervention and, in particular, the possibility of giving financial support to certain activities. In order to improve the Community's self-sufficiency, it is necessary to increase internal production so as

OIL PRODUCTION, RESERVES AND IMPORTS
(millions of tons 1978)



to cover a growing proportion of energy requirements. The majority of energy-producing installations — oil wells, coal-mines, refineries, power stations, etc. — require constant investment. In order to effect the desired changes, the energy sector will, therefore, have a massive and continuing requirement for capital investment.

This gives rise to two problems: that of finding the vast amounts of capital required, and that of ensuring that the investments made do not find their profitability threatened by a decrease, possibly deliberate, in the price of imported energy and the shift in consumption patterns which could result.

As regards the first problem, the ECSC Treaty makes it possible to finance industrial loans to the coal sector by borrowing, and this system has been in operation since the establishment of the European Coal and Steel Community. The same possibility exists in the nuclear sector, as a result of the Euratom Treaty, and proposals in this sphere were made for many years by the Commission; however, it was not until 1977 that the Council authorized the Commission to raise capital for on-lending to financing the construction of nuclear power stations and industrial installations for fuel recycling. The Council has authorized the Commission to negotiate loans up to an initial sum of 500 million European units of account¹, followed by a second instalment of the same amount, authorized in November 1979.

On a general level, the Council authorized the Commission in October 1978 to raise loans in order to promote investment in the Community. Under this decision, an instalment of 500 million EUA was authorized in May 1979 so that loans could be granted to finance investment projects in the infrastructure and energy fields. In this sector, the emphasis is laid on energy savings and the development of alternative energy resources.

In addition to these measures, the European Investment Bank is extremely active in the energy field.

Energy policy also ties in with industrial policy. The coal and nuclear industries, for example, have for a long time been a source of concern to the Community institutions. More recently, the Commission has concentrated its attention on the oil-refining sector.

Where surplus capacity and an imbalance between supply and demand for certain products are causing problems at a time when competition from exports of oil products from the oil-producing countries is on the increase. In order to obviate these difficulties, the Commission proposed to intensify its surveillance of this sector and to guide its future development essentially by means of mechanisms of information and consultation between all interested parties, both inside and outside the Community.

However, in increasing the profitability of the oil companies, recent market trends have alleviated the financial problems associated with the difficulties in the refining sector.

5. Rational utilization of energy and energy saving

One of the principal aims of energy policy is that of providing the consumer with the quantity of energy that he desires, in the most appropriate form, and using for this purpose

¹ 1 EUA (January 1980) = BFR 40.3135 / DKR 7.72413 / DM 2.48211 / FF 5.81136 / LIT 1 159.31 / HFL 2.73676 / UKL 0.649113.

the smallest possible amount of primary energy. This implies the elimination of waste, the reduction of losses and the improvement of conversion and utilization efficiency — in short, the rational use of energy and the achievement of energy savings. There was no question, therefore, of this measure affecting usable energy or impeding economic growth or social progress.

Among the aims of energy policy rational utilization of energy and energy savings are top priority, since by narrowing the scope of the problem they facilitate its solution.

Moreover everyone is responsible, since everybody can and should, in various ways, contribute to effecting economies in energy. However, the public authorities are responsible for provoking awareness of this need among domestic, agricultural, industrial and other consumers, and for modifying the legal and economic structures in order to combat wastage, losses and unsatisfactory yields.

In December 1974 the Council adopted a Commission proposal for a Community action programme, the aim of which was to help achieve a 15% reduction in primary energy demand in 1985, as compared to what the total would be without this action.

The matter is of considerable importance, since it is a question of some 200 mtoe, or at current prices, some thousand million dollars. The programme envisages both a procedure and a number of urgent measures in the domestic and tertiary sectors, and also in those of transport, manufacturing industries and energy industries.

Under the terms of the programme, the Council adopted in March 1976 five recommendations on concrete measures for the rational utilization of energy; these cover:

- (a) incentives for the thermal insulation of buildings;
- (b) efficient operation of heating installations in existing buildings;
- (c) improvements in driver behaviour in order to reduce the fuel consumption of road vehicles;
- (d) the promotion of public urban transport;
- (e) the operation of electrical appliances.

Following a communication submitted in early 1977, which emphasized the importance and urgency of intensifying the implementation of the Community programme, the Council adopted new recommendations on the following subjects:

- the regulation of heating, the production of hot water for purposes of hygiene, and measurement of heat levels in new buildings;
- the rational use of energy in industrial enterprises;
- the establishment of national consultant bodies, with a view to promoting the combined production of electrical energy and heat for district heating or industry;
- the reduction of energy requirements by improving the thermal efficiency of buildings.

It also adopted two Directives on:

- (a) the performance of heat-generators, and also the insulation of the heat distribution system in new buildings;
- (b) the indication by labelling of the energy consumption of domestic appliances.

If the progress achieved so far by the Member States and the Community is examined, as the Commission did in June 1979, it will be found satisfactory when compared with that of other industrialized countries. However, the rate of progress and even the extent to which the recommendations adopted by the Council have been implemented still vary considerably from one Member State to another and so there is still considerable energy-saving potential in the Community.

In June 1979 the Commission proposed that all the Member States adopt, if they had not already done so, basic programmes covering all sectors of consumption and appropriate price policies by the end of 1980.

All of these measures should contribute to a permanent dissociation of economic growth and growth in energy requirements, thereby lowering the ratio between the two to 0.8 in 1985 and 0.7 in 1990.

In the long term, it should be possible to save 15-30% of the energy now used in industry, 20-35% of that used by transport and up to 50% of that used in the domestic and tertiary sectors.

The Commission will therefore continue and step up its programme of concrete measures to rationalize the use of existing equipment and promote the use of more efficient equipment, installations and methods.

Furthermore, under the Regulation adopted in June 1978, the Commission will grant financial aid of 55 million EUA over a four-year period to demonstration projects on energy savings. The purpose of a demonstration project is to reduce the uncertainties attached to the commercial and economic viability of a given technique.

By helping the introduction of new processes onto the market, projects of this kind constitute a natural extension of research and development programmes. The financial aid given them by the Community in addition to any possible assistance from the Member States will, therefore, be assessed in conjunction with the national and Community research and development programmes.

The Commission would also like to see greater sharing of national experience in the rational use of energy, in order to select the most effective methods of energy saving, to coordinate national action and to determine the way in which the Community can best encourage such action.

Finally, the Commission has decided to conduct a detailed examination of the measures needed to restructure the economy so that it consumes less energy and to encourage lifestyles which limit the wastage of natural resources, in particular energy.

The abovementioned report by a panel of experts was published in July 1979 under the title 'Low energy growth'. It provides the basis for a general strategy for the rational use of energy in the Community.

6. *Greater use of nuclear energy*

The importance of the atom for Europe's energy supplies was recognized as early as 1957 in what was known as the report of the 'Three Wise Men'. According to this report, nuclear

energy should, after an interval of about ten years, that is to say from 1967 onwards, have begun to relieve the Community of the burden of oil imports, thus improving its supply structure and its overall situation.

The subsequent favourable conditions obtaining in the energy market — abundance of oil supplies and favourable prices — sharply reduced the Community's effort in this and curb the development of a greater use of nuclear energy.

It took the 1973 crisis to bring nuclear energy once again into the foreground among the sources which can be used to replace imported oil.

The minimum objective established in 1974 was to have available, in 1985, nuclear power stations with a total installed capacity of 160 GWe, or, for example, 160 units with an average rating of 1 000 MWe. This would account for more than one-third of total production of electricity and cover some 13% of total energy consumption.

But as the impact of the oil crisis wore off, nuclear programmes lost their momentum and the likelihood of the objective being achieved became increasingly remote. At present, it is unlikely that installed nuclear capacity in 1985 will exceed much more than 70 GWe, compared with the 160 GWe hoped for in 1974. This shortfall corresponds to around 100 million tonnes of oil a year, but one should take into account that the effects of this delay are slightly cushioned by the fact that the increase in electricity consumption is lower than forecast.

This trend is due partly to the apparent easing of the tensions affecting the energy market until the second half of 1978. It is, however, above all attributable to the very real difficulties encountered in the development of nuclear energy.

Although nuclear power stations produce electricity at a lower cost than conventional thermal power stations, they are extremely costly to build, and large-scale programmes require very considerable quantities of capital, which in the present economic situation presents serious problems. Of course, the Community can make use of its credit, as a borrower on the world capital market, to facilitate through loans the acquisition of the sums needed for investment in nuclear projects.

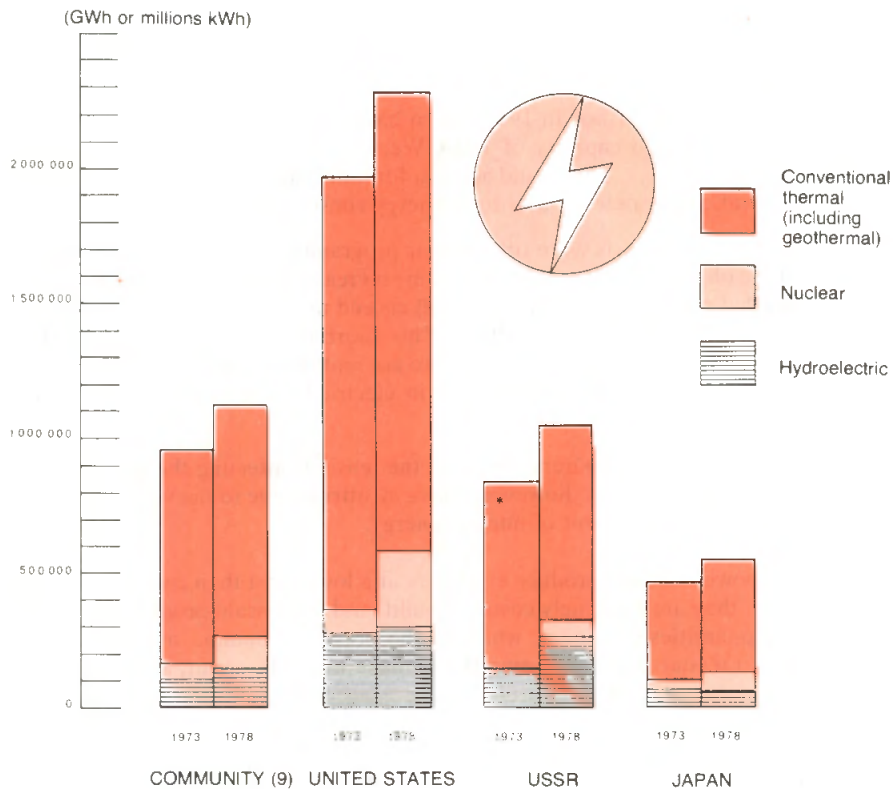
A further difficulty lies in the supply of nuclear fuels. For a long time it was thought that, although these fuels would have to be largely imported, their supply did not entail risks comparable to those which affect oil deliveries. However, the Commission has considered it necessary to formulate a policy for the supply of nuclear fuel; the aims of such a policy would be to ensure the availability of sufficient quantities of natural uranium at reasonable prices, and also of capacity for the enrichment and reprocessing of spent fuels, while at the same time promoting European Industry in these sectors.

This expansion is now taking place with regard to the enrichment of uranium: several installations for isotope separation are under construction in the Community and the first units have been put into service.

Action has also been taken since 1976 to develop uranium prospecting within the Community by means of financial aid to projects undertaken in the Member States.

The situation with regard to the reprocessing of irradiated fuels is the cause of much concern and it requires coordinated promotion at Community level together with the measures

ELECTRICAL ENERGY : NET PRODUCTION BROKEN DOWN BY SOURCE



* Including nuclear.

Source : EUROSTAT

needed to ensure the compatibility of this reprocessing with safety and the protection of the environment on the one hand, and the exclusively peaceful use of nuclear energy on the other.

However, the supply of fuel to nuclear power situations will still be dependent on external supplies: for some years to come in the case of enriched uranium and over a long period in the case of natural uranium. Moreover, growing concern by exporters of nuclear fuel and technology about the problem of nuclear proliferation is likely to mean that exports will be increasingly subject to safeguards and political considerations. The problems arising from this are at present the subject of negotiations directed towards solving the question of international security and at the same time obviating possible obstacles to the development of nuclear industries within the Community. It may be recalled in this connection that for more than twenty years the Community has had its own system of nuclear safeguards, which is now coordinated with that of the International Atomic Energy Agency (IAEA).

However, for some time past the chief of these obstacles has been public reluctance to accept expansion of the nuclear industry, because of the possible hazards to workers in such installations, to the population in their vicinity and the environment. These hazards must nevertheless be compared objectively with those associated with other forms of energy production.

This distrust has been deepened by the accident which occurred in March 1979 at the nuclear power station at Three Mile Island, near Harrisburg, in the United States, which resulted from a highly improbable series of component failures, chance circumstances and, in particular, human errors and insufficiently strict operating procedures. However, this accident did not involve any serious consequences for the staff, the general public or the environment.

The Community has been engaged since 1958 in a programme of action in the sphere of public health protection against radiation, in both the field of research and that of regulations and continuous efforts are being made to improve the design of nuclear installations and their methods of operation, from the point of view of safety and protection of the environment. Today, moreover, both the safety record and the level of safety in the nuclear industry are markedly superior to those of many other sectors of industry.

Nevertheless, the Commission has the firm intention of doing everything in its power to ensure that this degree of safety is maintained in the course of the industrialization of nuclear energy. In particular, it decided in May 1979 to set up a panel of experts to deal with nuclear safeguards, with a mandate to conduct a general review of the current situation as regards nuclear safeguards in the Community. This review will take into account the lessons which may be learned from the accident at Three Mile Island. This accident shows, for example, that the safety, protection and detection devices must be further reinforced; in addition, there should be frequent inspections of equipment and teams should be given improved training for both the normal course of operations and the action to be taken in the event of incidents or accidents. Finally, there should be better preparation of emergency plans to cope quickly and effectively with an accident, irrespective of how serious it is.

But nuclear safety is not restricted to the operation of power station reactors: it must also cover all the industrial stages of the fuel cycle. The problems raised by radioactive waste must be dealt with. A plan drawn up by the Commission aims to step up research into

TABLE 2

Electrical energy: Net production broken down by source (GWh)

		Hydroelectric	Nuclear	Conventional thermal						Total	Grand total
				Hard coal	Brown coal	Oils products	Natural gas	Gas derivatives thereof and other fuels			
Germany	1973	15 272	11 153	96 953	68 977	40 541	33 836	13 416	253 723	280 148	
	1978	18 204	33 856	96 144	82 255	30 817	61 427	9 857	280 500	332 560	
France	1973	47 543	13 969	26 592	663	69 003	9 674	7 036	112 968	174 480	
	1978	68 537	28 999	53 807	632	53 611	6 350	5 316	119 716	217 252	
Italy	1973	38 901	2 973	1 737	1 114	84 189	4 221	3 649	94 910	139 103*	
	1978	47 138	4 159	5 297	1 113	93 754	10 401	3 168	113 733	167 414*	
Netherlands	1973	—	1 015	1 459	—	6 376	39 815	1 562	49 212	50 227	
	1978	—	3 811	5 193	—	9 967	37 358	2 633	55 151	58 962	
Belgium	1973	615	68	4 873	—	20 345	9 240	3 980	38 438	39 121	
	1978	496	11 872	10 065	—	16 585	6 299	3 039	35 988	48 356	
Luxembourg	1973	826	—	12	—	369	136	762	1 279	2 105	
	1978	311	—	2	—	205	409	391	1 007	1 318	
United Kingdom	1973	4 524	24 310	163 927	—	64 835	3 573	1 469	233 804	262 638	
	1978	5 194	32 462	176 715	—	49 716	3 953	764	231 148	268 304	
Ireland	1973	639	—	70	1 627 (Peat)	4 626	—	—	6 323	6 962	
	1978	1 013	—	46	1 806 (Peat)	6 464	—	—	8 416	9 429	
Denmark	1973	24	—	6 423	—	11 557	—	—	17 980	18 004	
	1978	23	—	10 478	—	9 022	—	—	19 500	19 523	
Community (9)	1973	108 344	53 488	302 046	72 381	301 841	100 495	31 874	808 637	972 788*	
	1978	140 916	115 159	357 747	85 806	270 241	126 197	25 168	865 159	1 123 618*	

* Including geothermal production in Italy (2 319 in 1973, 2 384 in 1978).

Source: Eurostat.

conditions in which radioactive waste can be disposed of in the safest possible manner for, in some cases, almost unlimited periods, and also the identification, at Community level, of the sites offering the best guarantees in this respect.

The Commission is also carrying out measures designed to ensure that the decommissioning and dismantling of nuclear installations at the end of their economic activity is fully compatible with the requirements of safety and of protection of the environment.

In conclusion, the Community research programmes broadly reflect these varied concerns for the safety of workers and the surrounding population and the protection of the environment.

However, in addition to the safety of reactors and protection against ionizing radiation, Community research is also seeking to extend the applications of nuclear energy and encourage the development of new types of reactor which will be more economical and make more efficient use of nuclear fuel. These are fast-breeder reactors (FBRs) — a new type of nuclear reactor which makes it possible to extract much more energy from fissile fuels than the present reactors.

The Commission observes that, in the context of a persistent and increasingly rapid deterioration in the Community's hydrocarbon supply position after the year 2000, it is important to maintain and, if possible, increase the proportionate share of nuclear fission in the energy balance of the Community during the first half of the next century. Fast-breeder reactors should therefore be available for electricity production on a commercial basis during the 1990s. However, this necessitates a considerable effort to perfect FBR technology and, above all, to ensure safe working conditions and the protection of the environment. It is on these two aspects that the Community's efforts must principally be concentrated.

Increased use of nuclear energy also requires better information for the public on these various aspects and the Commission is attempting to make its contribution. In November 1977 and early 1978 it organized meetings to explain to representatives of public opinion the various aspects of the nuclear problem and to carry out an objective investigation into the conditions to be fulfilled if nuclear energy is to fit harmoniously into the Community's future energy supply.

7. The development of secure alternative resources

After long being the major, and almost the sole, source of energy supply for the Community, coal rapidly declined in importance after 1960. Until the crisis, European coal policy was based principally on a progressive cutback in production, within the limits imposed by regional requirements and the problems of employment.

The upheaval that occurred in 1973 led to reappraisal of this policy, with a view to halting the decline in output. Subsequent developments and recent events have confirmed the importance of restoring and maintaining the 1973 level of production, i.e. 270 million tonnes. This is the target set for 1985 and proposed for 1990. Accompanied by higher coal imports, this policy will mean that in 1990 solid fuels will still provide a large share (18%) of energy supplies, and this will reduce oil imports.

However, the aim defined in 1974 does not appear easy to achieve. The coal industry was faced with a difficult situation in 1975 owing to the low level of demand and, despite the increase in energy prices, its financial position deteriorated between 1976 and 1979, since cost increases outpaced earnings. It is, therefore, more necessary than ever to aid the Community's coalfields financially; consequently, at the beginning of 1976 the Commission formulated a new set of Community arrangements covering intervention by the Member States in favour of the coal industry. Furthermore, it was repeatedly decided (the last time being December 1979) to extend the uniform system of aid to coking coal and coke, which is designed to maintain a sizeable production of coking coal within the Community in order to ensure a relatively independent supply for the European iron and steel industry.

With regard to market outlets, in late 1976 the Commission proposed measures designed to encourage the use of coal for the production of electricity by granting subsidies to assist the construction of a significant number of additional modern coal-fired power stations. It is also seeking to increase total coal consumption and encourage the marketing of techniques for the liquefaction and gasification of solid fuels.

Monitoring of coal imports has also been introduced, in order to ascertain market trends more accurately and rapidly. Furthermore, the research into coal technology pursued in recent years will be maintained in the future.

Today, coal is no longer the Community's only resource, and urgent efforts must be made to develop the considerable resources of oil and gas existing within the Community and, in particular, under the North Sea. Community oil production reached 63 million tonnes in 1978, and that of natural gas 135 mtoe. It must continue to grow over the next few years and everything must be done to maximize the exploitation of the fields discovered and to ensure the renewal of exhausted production capacities, the objective being to attain and permanently maintain the highest possible level of production. In 1990 it is therefore hoped to achieve 125 million tonnes of oil a year and an almost identical volume of natural gas.

In order to maintain this effort, the Community grants financial assistance to Community research and development projects involving new techniques for the prospecting and exploitation of hydrocarbons in particularly difficult areas such as the North Sea. Five successive annual allocations of aid representing almost 200 million units of account have been granted so far, covering about 170 projects involving investment of more than 500 million.

The Community also proposes to increase purchases of natural gas from non-member countries. Like the increase of coal imports, these purchases will have the advantage, if not of alleviating the balance-of-payments situation, then at least of diversifying the types and sources of external supplies. It is also necessary to make the best possible use of available resources. In addition to its programme on the rational use of energy, the Community is restricting the use of natural gas and petroleum products in power stations, in order to reserve available hydrocarbon fuels for those uses in which they offer a specific advantage or for those in which, as in the case of vehicle fuels, they do not currently have any substitute.

However important and indispensable they may be, the solutions which a policy based on voluntary cooperation may bring to energy supply problems, are subject to limitations which can be overcome only by technological progress and its industrial application. The implementation of an overall strategy in the energy sector therefore makes the continuation of Community research programmes particularly necessary.

In addition to those actions already under way, in respect of coal, hydrocarbons and nuclear fission and fusion, since 1975 the Commission has been developing:

- (a) energy conservation by improving production techniques;
- (b) production and use of hydrogen as a new source of energy;
- (c) use of solar energy;
- (d) use of geothermal energy;
- (e) energy systems modelling.

A second research and development programme for the energy sector was adopted for the four-year period 1979-1983. The total amount comes to 105 million EUA, almost double that of the first programme, and although the same fields are covered there is a very distinct shift towards solar energy and energy saving.

The Community devoted just over 100 million EUA to its entire programme of energy research and development in 1976 and almost 200 million in 1978. This considerable increase in Community action is accompanied by a parallel increase in the action of the Member States: in 1978, as in 1976, the amount spent by the Community as such represents 8% of total public expenditure on energy research in the Community.

Moreover, it is not sufficient merely to make discoveries. The Commission therefore gives financial assistance to demonstration projects for sources of energy other than oil. This involves the encouragement on an industrial or semi-industrial scale of techniques and processes which have been proved scientifically feasible but whose technical and economic viability has yet to be demonstrated.

Alongside the aid granted to demonstration projects in the field of energy saving, financial support is given to projects to exploit alternative energy sources. In April 1979 the Council authorized the Commission to grant partly refundable loans to a total of 95 million EUA over a five-year period. Projects in the following sectors may receive the aid:

- i) exploitation of solar energy (22.5 million EUA);
- ii) exploitation of geothermal energy (22.5 million EUA);
- iii) liquefaction and gasification of solid fuels (50 million EUA).

One research and development project of particular importance is that relating to controlled thermonuclear fusion. This project, which has been under consideration for a long time, was finally decided upon in October 1977 when, after two years of discussion, the Council of Ministers agreed to entrust its realization to the Culham Research Laboratory in the United Kingdom.

This project, which has been named JET (Joint European Torus) will be jointly conducted and financed. If all the technical problems can be resolved, JET, which is a most promising project, may represent a decisive step towards the production of energy from deuterium and lithium, raw materials which are available in almost unlimited quantities. At present, it appears that the fusion of light atoms may, along with solar energy, represent a major contribution by the energy sector in the third millennium if it can be mastered industrially.

8. *Security of supplies*

The majority of the measures described above are designed to increase the security of supplies, directly or indirectly. However, they do not protect the market from all fluctuations. It is therefore necessary to organize storage arrangements which constitute a buffer against the effect of accidental or deliberate interruptions in supplies, providing, in the case of deliberate interruptions, a certain capability for resistance to economic or political pressures applied by the suppliers.

The Community has for a long time had a regulation providing for the obligatory storage of oil and oil products; the level of this is fixed, at present, at 90 days' consumption.

In May 1977, the Commission proposed measures to facilitate optimum use of the Community's existing capacities, and also to alleviate the considerable burden represented by the financing of storage capacity, especially in the case of small and medium-scale companies.

Moreover, since the beginning of 1978 the Member States have ensured that electricity producers maintain in thermal power stations sufficient stocks to ensure a supply of power for at least thirty days.

The Community has also given itself the means to ensure that the trade flows between the Member States are maintained if there is an accidental interruption in certain oil supplies and that the burden resulting from the shortage is evenly divided.

A decision of February 1977 regulates trade in crude oil and petroleum products between the Member States in the event of supply difficulties.

A decision of November 1977 permits a harmonized reduction of energy consumption throughout the Community in the same circumstances. A Directive of July 1973 calls for the coordination of the measures to be taken by the Member States to make withdrawals from stocks, restrict consumption and regulate prices in order to avoid any abnormal increases.

9. *International aspects*

The importance of external supplies in the Community's energy supply pattern has resulted in international relations becoming an essential factor in energy policy.

Within the context of this cooperation between the oil-consuming countries, the Council has established general guidelines for international cooperation in the development of energy resources:

- the oil-consuming countries mutually recognize each other's right to free access to energy resources;
- they agree to refrain from all discrimination towards the consumers of Community partner States, with regard to prices and conditions of access to energy resources;
- they will establish by common agreement a system of objectives for the production and conservation of energy, designed to constitute guidelines for their national policies;

- they will establish a procedure for the regular evaluation of progress achieved and obstacles encountered in the application of these principles and the pursuit of these objectives;
- within the context of cooperation in the development of alternative energy sources, the countries concerned will share the costs incurred in proportion to the benefits which they will derive from these activities.

It is in this spirit that the Commission participates in the work of the International Energy Agency, as in other activities of OECD in the energy sphere.

The importing countries which are members of the Agency have considered the question of sharing out the available resources among themselves as effectively as possible in the event of supply difficulties. These measures dovetail with those taken by the Community to cope with supply difficulties.

The Community is also taking part in the consultation procedure which was set up between the major industrialized countries at the Western summit conferences. At the latest conference held in June 1979 in Tokyo, the United States, Canada and Japan moved into line with Europe by restricting oil imports at the current level. The countries attending the conference also confirmed their common determination to save energy, develop alternative sources of energy and fight against speculative price increases.

The energy crisis also led to various attempts to initiate a 'dialogue' between the oil-producing and oil-consuming countries. A preparatory meeting devoted entirely to energy was held in Paris in April 1975, and proved to be a failure, because the developing countries requested that the discussion should not be confined to this subject and drew attention to the whole range of problems arising from the deterioration in their economic situation.

After it was finally agreed to broaden the scope of the discussion in this manner, the Conference on International Economic Cooperation was held in Paris, from December 1975 to June 1977.

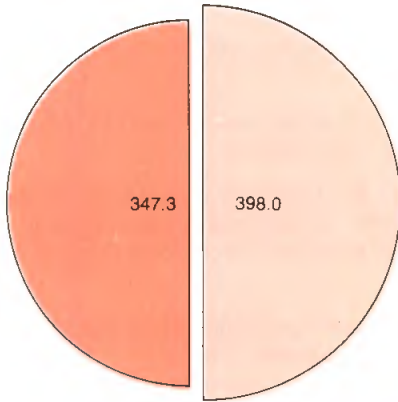
The 'North-South Dialogue' so begun was not without difficulties, and the final report includes almost as many points of disagreement as of agreement. As regards energy, the points of agreement were very general in character:

- a conclusion and a recommendation regarding supplies, on a commercial basis, subject to the obligation to maintain purchasing power;
- recognition of the finite nature of oil and gas resources, and the transition from a mixture of energy supplies based on oil to more permanent and renewable sources of energy;
- the need for conservation and increasingly efficient use of energy;
- the need to develop all forms of energy;
- general conclusions and recommendations for national action and international cooperation in the energy sphere.

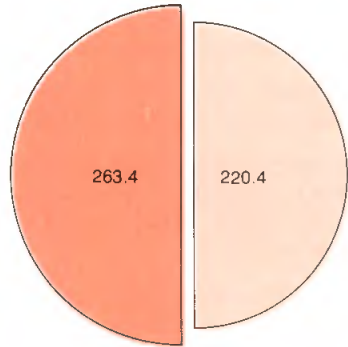
The North-South dialogue is now being resumed through the United Nations in the form of general multilateral negotiations. These negotiations, due to start in spring 1980, will deal not only with energy but also with commercial and financial questions, raw materials and development. The industrialized countries are coordinating their approach to these negotiations both at Community institution level and within the OECD.

CRUDE OIL EXPORTS OF OPEC STATES

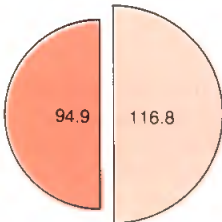
(million metric tons)



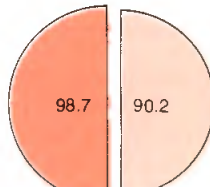
SAUDI ARABIA



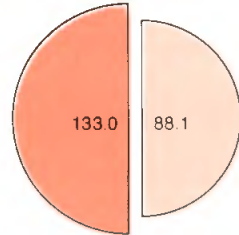
IRAN



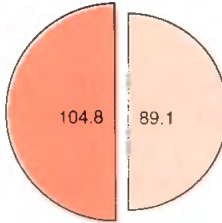
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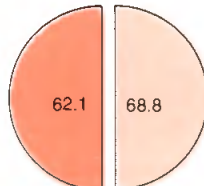
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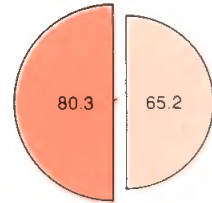
KUWAIT



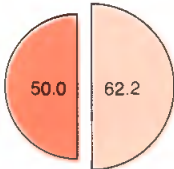
LIBYA



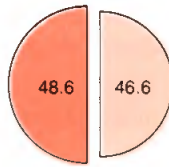
ARAB EMIRATES



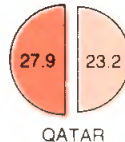
VENEZUELA



INDONESIA



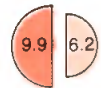
ALGERIA



QATAR



GABON



ECUADOR



As regards East-West relations, the United Nations Economic Commission for Europe is the appropriate setting for implementing the Final Act of Helsinki (Conference on Security and Cooperation in Europe) as regards energy. A new body called the 'Group of Senior Advisers to ECE Governments on Energy' was set up for this purpose at the 34th meeting of the ECE.

It must be observed that, in these discussions, the Community normally tends to promote its own interests, but at the same time it makes every effort to understand and to take account of those of the other parties, since a balanced situation bestowing mutual advantages is the best guarantee of a long-term stability in international relations.

Under the recently-renewed Lomé Convention, the Community has special responsibilities towards the countries of Africa, the Caribbean and the Pacific (the ACP countries) which are parties to this convention.

The Convention provides for Community measures to develop the mining and energy potential of the ACP countries and, at the same time, to diversify its own sources of supply for minerals and energy.

Finally, it should be recalled that international discussions were initiated in 1977 on the problems of nuclear energy and, in particular, on the problems raised by the nuclear fuel cycle (enrichment, reprocessing, waste, etc.) as a result of measures recently proposed by the United States. In view of the importance of nuclear energy to the Community, both the Community and the Member States must adopt, in this connection, united and coordinated positions. These discussions are now in their final stage and their outcome should have a beneficial effect on international trade in nuclear materials.

Final considerations

In spite of the unanimous agreement on the need, in present circumstances, to formulate and implement an energy policy within the context of the European Community, the detailed preparation of this policy appears to be very laborious and progress very slow.

There are frequently long delays between the submission of proposals by the Commission and the decisions of the Council. The Community often reacts too late to the rapid development of circumstances, and the delay is sometimes so great that proposals become out of date before being adopted. Moreover, often the Member States being conscious of this delay, are led to take unilateral action, in some respects as a precaution, which makes agreement on the measures proposed more difficult, if not impossible. Consequently there are still gaps in Community energy policy.

The blame for this situation is frequently attributed to the absence, on the part of the Member States, of sufficient political will to encourage European integration in the sphere of energy.

It must, however, be understood that this is an extremely complex sphere, involving both technical and economic problems, and a tangled web of causes and effects relating to scientific research, technological development, economic growth, social progress, international relations, and commercial and financial equilibrium, not to mention repercussions on the environment.

The search for greater convergence between national energy policies is complicated by the gravity of the economic and financial repercussions of the vicissitudes on the energy market and the diversity of the economic measures adopted to cope with them.

Moreover, the Member States display differences in attitude which themselves tend to create differences in national situations and in 'political philosophy', or even the degree of progress of their national economic or energy policies.

Lastly, as we have seen, energy policy must continually adapt itself to current developments, and is not exempt from drastic upheavals or dramatic changes.

Nevertheless, an attempt to take an overall view of Community energy policy, even in the form of a rapid survey such as that given here, makes it clear the principles formulated, the aims adopted, the measures already taken and those which will be implemented in the near future, already form an impressive and coherent overall picture.

Although there may not yet be any sign in actual events of the 'grand design' of a common energy policy, enough 'small steps' have already been taken to consolidate the progress achieved so far and to lay the foundations for further progress.

Glossary

- **Toe: ton oil equivalent.** This unit makes it possible to express in comparable fashion and hence to totalize the different energy sources in terms of their equivalent calorific values. The standard used is the calorific value of one ton of oil.

1 toe = 1×10^7 kcal or 10 million kilocalories

1 mtoe = 1 million toe = 1×10^{13} kcal.

- **Tce: ton coal equivalent.** Another unit of equivalence: based on coal

1 tce = 7×10^6 kcal or 7 million kilocalories, or 0.7 toe.

1 mtce = 1 million tce = 7×10^{12} kcal.

- **Calorie:** quantity of heat required to raise the temperature of 1 gramme of water by 1 degree C
1 kilocalorie or kcal = 1 000 calories

- **Kilowatt or (kW):** unit of power equal to 1 000 watts. It is used in particular for electricity; in this case the term is the electric kilowatt or kWe.

There are many other multiples of the watt, including:

- the electric Megawatt or MWe = 1×10^3 kWe = one thousand electric kilowatts,
- the electric Gigawatt or GWe = 1×10^6 kWe = one million electric kilowatts.

- **Kilowatt-hour or kWh:** unit of energy equivalent to the energy supplied during one hour by a machine with a power output of one kilowatt.

The more usual multiples are:

- the Gigawatt-hour or GWh = 1×10^6 kWh = 1 million kilowatt/hour,
- the Terawatt-hour or TWh = 1×10^9 kWh = 1 thousand million kilowatt/hour.

- **Primary energy:** energy obtained directly from nature. The following are examples of primary energy:

- fossil fuels: coal, crude oil, natural gas, brown coal/lignite, peat;
- hydroelectric energy;
- geothermal energy (hot water or steam sources);
- tidal energy;
- wind energy;
- solar energy;
- nuclear energy (produced by controlled reactions in the nucleus of the atoms of certain substances).

In certain cases, these forms of energy may be used directly (e.g. coal burnt in the hearth) or else transformed (e.g. coal burnt in a power station to produce electricity).

- **Secondary energy:** energy from a transformation process. A typical example is electricity which is generated in thermal power stations by transforming fossil fuels (however, some electricity is generated directly in hydroelectric and geothermal plants).

Nuclear energy is difficult to classify because so far it has been generated in the form of electricity by processing fissile materials (uranium, thorium, plutonium). It is generally classified as primary energy.

● **Arabian light 34° API:**

- API (American Petroleum Institute) density: the scale employed to express the density of the oil;
- formula for converting API density into decimal density (at a temperature of 60°F, i.e. 15.56°C):

$$\text{API density degrees} = \frac{141.5}{\text{decimal density}} - 131.5$$

(e.g. Arabian light 34° API = decimal density 0.8550)

Further reading

General

- General Report on the Activities of the Communities (annual)
Chapter 'Energy Policy'
 - Bulletin of the European Communities — Commission (monthly)
Chapter 'Energy Policy'
 - The Energy Situation in the Community
Situation 1900 — Outlook 1900 (annual)
 - Energy Statistics, Yearbook 1969-73
Yearbook 1973-77
 - Eurostat, Luxembourg 1974
Eurostat, Luxembourg 1979
 - Community Energy Policy
Texts of the relevant legislation
Brussels 1976
Texts of the relevant legislation
(first supplement)
Brussels 1979
- (These two documents contain all the texts relating to energy policy published in the *Official Journal* of the Communities up to 31 December 1978).

Cat. No 6772
Cat. No CA-24-78-992-4A-C

Cat. No CH-22-76-132-EN-C

Cat. No CB-28-79-132-EN-C

Chapter III.1

- First guidelines for a Community energy policy (without annexes)
(Communication from the Commission to the Council of 18 December 1968)
Brussels, 1968, 196 pp. Supplement 12/68 — Bull. EC.
- Necessary progress in Community energy policy
(Communication from the Commission to the Council of 13 October 1972)
Supplement 11/72 — Bull. EC.
- Energy policy: problems and resources 1975-85
(Communication from the Commission to the Council, 1972) 28 pp.
in: Problems, resources and necessary progress in Community energy policy 1975-85
Brussels, 1972
- Guidelines and priority actions under the Community energy policy
(Communication from the Commission to the Council of 27 April 1973)
Supplement 6/73 — Bull. EC.

Cat. No 8259

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Chapter III.2

- Towards a New Energy Policy Strategy for the European Community (Communication of the Commission to the Council of 5 June 1954) Supplement 4/74 — Bull. EC.
- Implementation of the energy policy guidelines drawn up by the European Council at its meeting in Rome on 1 and 2 December 1975 (Communication of the Commission to the Council of 16 January 1976) Stencilled doc. No COM (76) 20
- Community energy policy (Communication of the Commission to the Council of 30 September 1976) Stencilled doc. No COM (76) 508 final.

Chapter III.3

- Community energy policy — Objectives for 1985 (Communication from the Commission to the Council of 27 November 1974) Stencilled doc. No COM(74)1960 final
- Report on the achievement of the objectives for 1985 Stencilled doc. No COM(76) final of 16 January 1976
- 2nd report on the achievement of the objectives for 1985 Stencilled doc. No COM(77)395 final of 29 July 1977
- Energy objectives for 1990 and programmes of the Member States Stencilled doc. No COM(78)613 final of 16 November 1978
- Energy objectives of the Community for 1990 and convergence of policies of Member States (Communication and Draft Resolution) Stencilled doc.No COM(79)316 final of 14 June 1979
- The energy programme of the European Communities Stencilled doc. No COM(79)527 final of 4 October 1979
- Council Regulations (EEC) of 9 April 1979
 - fixing the maximum amount of aid to be granted as financial support to projects to exploit alternative energy sources;
 - on the implementation of the Council Regulation (EEC) of 12 June 1978 in the solar energy sector, in the solid fuel liquefaction and gasification sectors and in the geothermal energy sector OJ L 93 of 1979
- The energy situation in the Community. Prospects and policy Stencilled doc. No COM(78)464 final of 21 September 1978
- Relations between the Community and the energy-producing countries Stencilled doc. No COM(74)90 final of 23 January 1974
- Cooperation with developing countries in the field of energy Stencilled doc. No COM(78)355 final of 31 July 1978
- Instruments of mining and energy cooperation with the ACP countries Stencilled doc. No COM(79)130 final of 14 March 1979

- Energy for Europe: research and development
(Communication of the Commission to the Council of 5 April 1974)
Supplement 5/74 — Bull. EC.
- Programmes of research and development actions in the field of energy
(presented by the Commission to the Council on 8 January 1975)
Stencilled doc. No COM(74)2150 final
- Council Decision of 11 September 1979 adopting an energy research and development programme
1979-83
OJ L 231 of 1979

Chapter III.4

- Commission Decision of 30 May 1979 amending the Commission Decision of 26 January implementing the Council Directive of 4 May 1976 regarding a Community procedure for information and consultation on the prices of crude oil and petroleum products in the Community
OJ L 170 of 1979
- Commission Decision of 15 June 1979 laying down detailed rules for the implementation of the Council Decision of 7 November 1977 on the setting of a Community target for a reduction in the consumption of primary sources of energy in the event of difficulties in the supply of crude oil and petroleum products
OJ L 183 of 1979
- Council Regulation (EEC) of 28 August 1979 introducing registration for crude oil and/or petroleum product imports in the Community
OJ L 220 of 1979
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OJ L 297 of 1979
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OJ L 314 of 1979

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- A Community action programme on the rational use of energy
(Communication to the Council of 5 November 1974)
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- Council Directive of 14 May 1979 on the indication by labelling of the energy consumption of household appliances
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(Communication from the Commission to the Council)
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OJ L 151 of 1978
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This brochure gives a detailed account of the national and international economic aspects before and during the energy crisis. It describes the need for a common energy policy, the initial achievements and the way in which reactions to the energy crisis have developed.

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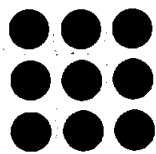
Energy is a determining factor in the operation and development of a modern economy. Over the past twenty years the European Community, most of whose Member States used to be relatively self-sufficient as regards energy supply, has gradually become dependent — as a whole and to a considerable extent — on outside supplies, primarily of oil.

Since 1973 there have been frequent disturbances, which have increasingly affected the quantities supplied and the prices charged. . . The standard of living of 250 million citizens of the European Community is now threatened.

The effect of the energy crisis has simply been to highlight more starkly than ever the need for a common energy policy. To this day, no such policy exists.

This brochure sets out the need for a common policy. It contains the basic information concerning the energy sector for both the world and for the Community.

The first steps towards introducing a common energy policy have been taken, and the basic options have been decided upon at the highest level of the European Community. But it will still be necessary to marshal and deploy a large number of instruments if the European Community is to be enabled to guarantee its future energy supplies.



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