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TOWARD A SINGLE ENERGY POLICY

Individual National Policies vs. a Concerted
European Policy

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I fully appreciate what an honour the Centre Européen Universitaire of Nancy has done me in asking me to speak to you here today. The invitation and the honour are not so much for me personally as for the Head of the Directorate General of Economic Affairs and Energy of E.C.S.C. -- E.C.S.C. which is blazing the trail for the European communities in the field of energy. However, for the record, I must emphasize that what I am going to say must not be taken as committing anyone but myself.

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My talk forms part of a series, of which I know only the subject titles: it is therefore quite possible that I shall make some of the same points as those coming before or after me, or some that contradict them. I apologize for the repetitions, if any: they are due to the fact that energy policy has to cover most aspects of the energy economy, and meet as far as possible the problems posed for Europe by the revolution in the energy sector.

The contradictions, on the other hand, I welcome. In a field so complex and so new, nobody can honestly claim to offer the panacea. Progress consists in patiently comparing and contrasting views until a certain consensus of opinion, is arrived at among the parties. Moreover, as I shall try to show you, the position is still far from clear with regard to many essential elements of the problem. Contradictions, therefore, may be of value as throwing light on aspects which have been overlooked by some of those concerned.

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So much for my preliminary observations. I am here to speak to you about energy policy, and in particular of the co-ordination of national policies with the object of arriving at one European energy policy.

My talk is to initiate that section of this series of lectures on energy which deals more particularly with economic policy. This being so, and since, besides, I am speaking to a University audience, which may be expected to look for scientific accuracy, I should like to discuss certain fundamental matters in connection with the elements and the theoretical solution of the problem of an energy policy.

Of course, what I am concerned with all the time, and what you are concerned with today, is the action that is in fact being taken in this field. There can be no valid theory that does not issue in possible action. Yet for many years as a Civil Servant in my own country, and for some time as an international Civil Servant, I have seen that what is hardest to find for the purpose of conducting consistent economic policies is neither ability to make sound and penetrating technical analyses, nor keenness and efficiency in day-to-day activities: it is the mental equipment for forming a picture of the difficulties involved, probing the scope and ramifications of the question, and bringing home to those holding political responsibility the various margins of uncertainty and the nature and implications of the alternatives -- or the absence of alternatives.

Accordingly, I am going to try to delimit the twilight zones surrounding the actual vital points of choice themselves. I propose to deal, first of all, with the definite considerations of fact which must be taken into account in working out an energy policy, then with the theoretical approach to the rational framing of such a policy, and finally with ways and means of arriving at a practical solution.

PART ONE

Considerations of fact needing to be taken into account in working
out an energy policy

The essential features of the energy economy latterly may be summed up as being steadily-increasing keenness of competition and a definite imbalance therein.

These two characteristics stand out sharply when we glance over the course of technological progress to date and over the structural development of the energy economy. And they make it at once more necessary and more difficult to reconcile national interests with the interests of the European community as a whole.

A. Characteristics of the energy economy

1. The technological revolution and competition

The considerations of fact in connection with the energy economy in Europe all derive from the speeding-up of technological development. As this process is affecting in differing degrees the prospection, production, transport and consumption of each of the sources of energy, it is profoundly altering the tradition pattern and balance in the markets of those sources. I shall only briefly sketch the outlines of this technological revolution, about which you will certainly already have been told in some detail.

You will know of the striking rise in output per man/shift in the community coalmining industry, due to the collieries' drive to adjust themselves to increased competition. The average underground O.M.S., which in 1951 amounted to 1,392 kilograms, stood in 1960 at approximately 1,900.

Nevertheless, despite this outstanding improvement, there are still very marked disparities between one coalfield and another. Southern Belgium's underground O.M.S. works out at about 1,450 kilograms, the Ruhr's at 2,100, the Netherlands' at just under 1,800, and Lorraine's at just under 2,600. These differences are so considerable, even if we take into account the diversity of the types and grades involved and of the degree of geographical protection enjoyed, as to raise a problem of competition among the various European coals themselves -- a problem exacerbated by the fact that the E.C.S.C. Treaty postulates the free movement of coal between community country and another.

Moreover and still more important, European coal as such is now under very much heavier pressure from imported coal. American coal in particular, having been compelled at an earlier stage and under more favourable geological, economic and social conditions to adjust itself to competition from other sources of energy, has registered major increases in productivity. Thus the average productivity in the American collieries has risen by something like 80% in the last eight years, as against Europe's 38%. The average O.M.S. overall (underground and surface) was in 1960 12,000 kilograms, as against 1,100 in Belgium and 1,600 in Germany. Some American opencast mines are even recording 25 tons per man per day, and certain very highly-mechanized deep pits anything up to 45.

This coal, though very economic to mine, was not a really serious competitor for so long as Europe was protected by its remoteness. But of late overcapacity and modernization in the shipping industry have combined to send maritime freight-rates plunging. Average coal freights have fallen by more than 50% since the days before the Suez crisis.

American coal can be delivered to many European consumers at lower prices than a very great number of European collieries are able to quote economically. This revolution in the transport sector thus raises the problem of competition between European coal and imported coal.

Technological progress has also brought about sweeping changes in the oil and gas sectors.

New prospecting, drilling, extraction, transport, refining and distribution methods have radically altered the supply position with regard to oil and natural gas. Over and above the tremendous advances in the working of the older reserves, there has been a stepping-up of prospecting activities which has resulted in the discovery of a number of new ones.

It is estimated that there is already in the world a surplus of installed or potential oil production capacity amounting to something like 200 million tons a year -- about one-fifth of today's world production. With the tanker fleet undergoing modernization, more and more refineries being built at strategic points in the European market, the pipeline network growing, it is now a fact that many European collieries are faced with the loss of the geographical protection they have hitherto enjoyed.

Further, the practicability of reducing natural gas to liquid form and transporting it in large "methane tankers" has been definitely established, while the results of experiments with the transportation of such gas by submarine feeder suggest that this too is likely to become a common means of transport, along with the pipelines already installed to carry off the growing production of the European gasfield. In the course of the sixties, therefore, European coal will be exposed to considerable competition from this new quarter as well as from oil.

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Side by side with this abundance of supply, there has been a widening in the range of suppliers. We are witnessing the advent, on a small scale as yet but certain to increase, of oil from North Africa; we are witnessing a comeback, also minor but constituting only a beginning, by oil from the Soviet Union.

The technological revolution has convulsed the whole organizational set-up of the market. In the inter-war period there was a kind of balance, maintained and controlled by a few big international companies, which amounted in practice to pro rata allocation in the Middle East serving to safeguard both reserves and prices in the United States. This balance has been seriously impaired by intensified rivalry to keep or to enlarge each party's share of the market -- rivalry among the big companies themselves, and rivalry between them and newcomers seeking to make their way also.

Technological revolution and organizational evolution have combined in a market always highly sensitive to the smallest surplus of supply to produce a price war centred on Europe.

The United States, as the world's biggest consumer (with 50%), is endeavouring to safeguard both its own reserves and the profit margins on its own oil (which is more costly than that imported from overseas) by pursuing a more and more protectionist policy. It is throwing on to the world market larger and larger tonnages of crudes and petroleum products in the hope of finding buyers. And this increased competition, coupled with the rising pressure from African and Russian oil, is primarily focused on the world's second biggest consumer, Europe (19%).

As a result, the European community, the one major economic area with no oil policy of its own, tends to be special theatre of the price battles waged as part of this war of oil against itself.

Since coal is still the main source of energy produced in Europe (68%) while oil is for the most part imported (crude oil produced in the European community represents less than 20% of net imports of crudes and petroleum products), the upheavals in the oil market are obviously bound to have the most far-reaching repercussions on the European coal market.

Thus the relation of oil to oil, already a problem in its own right, poses a fortiori the problem of the relation of oil to coal.

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For if the technological revolution with regard to the supply of energy is resulting in keener and keener competition among the different sources of energy, that competition is still further intensified by the process of technological development which is affecting the demand for energy.

This process may be roughly described as an increase in that portion of the energy economy in which, in consideration of factors relating to convenience in handling, thermal efficiency and flexibility of employment, petroleum products may usefully be substituted for coal.

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Accordingly, even if for the time being we take no account of the further problems which are bound to arise when atomic energy becomes available, the facts remains that in consequence of the various factors I have listed the whole face of the energy sector in Europe is undergoing a radical change.

The essence of this change is an outstandingly rapid increase in the consumption of petroleum products.

1955 - 1960

Growth of industrial production	120%
" " energy consumption	56%
" " consumption of solid fuels	17%
" " consumption of petroleum products	400%

Oil's share in Europe's energy consumption is thus growing by leaps and bounds. Whereas up to the First World War the energy market retained its nineteenth-century pattern, with coal serving to cover practically the whole of demand, and whereas even as lately as 1950 82% of the demand for primary energy was met by solid fuels (hard coal and brown coal), today solid fuels account for only 60% of the whole. Oil, on the other hand, has increased its share from 12% in 1950 to over 27% in 1960.

The fact that coal thus represents a smaller and oil a larger proportion of a total energy consumption which has risen by 60% in ten years also means that Europe is now much more dependent than heretofore on imported energy. Oil imports, which in 1950 accounted for some 10% of internal consumption, today account for something like 28%.

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The outstanding feature of the energy economy is therefore tremendously intensified competition -- competition among the producer of each individual source of energy and over and above that competition among different sources which are becoming more and more readily interchangeable and are at the same time being imported more and more from outside the European community.

Hence, the first objective of an energy policy must be as far as possible to co-ordinate the various sources of energy within themselves.

But such a policy can be effectively pursued only if account is taken, firstly, of the structural differences affecting the competitive capacity of the individual sources of energy, and secondly, of the differences in the member countries' supply and demand positions, which govern the countries' reactions to international undertakings entered into.

2. Structural factors and competition

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The competition with which we are concerned is operating between products whose behaviour in the market is influenced by wholly different conditions of production and sale.

The coal sector is characterized by a certain inherent rigidity which is the combined result of history, of geography and of social and political considerations.

The coalmining industry is an old-established one, a highly regionalized one, and a labor-intensive one -- all points tending to make it less readily adaptable to changed circumstances.

The economy of whole areas has come to be centred on the working of the coal fields, and would become seriously unbalanced if the coalfields were worked no longer. This would necessitate industrial and social redevelopment -- inevitably a long and difficult process.

Again, the industry being one in which considerable time must elapse before new units are ready to go into production and capital investment can yield a return, it cannot respond promptly to a rapid rise in demand (ten to fifteen years are needed to bring a new pit into operation). And as a labour-intensive industry -- labour costs amount to 60% of its total costs, -- it can adjust itself only inadequately and by stages to a sudden steep fall in demand. What is more, when a substantial shrinkage does occur in the colliery labour force, the result is, under some social-security systems now in force, that the coal produced today is still more heavily burdened, and its competitive capacity still further impaired, by financial charges from the past in the form of pensions due to the now-retired miners who produced the coal of previous years.

And then, with two-thirds of its charges of the kind described as "variable", the coalmining industry is ill suited to stand up to fluctuations in the market situation: often restricted as to its price strategy at times when business is brisk, its only resources when business is bad are to allow stocks to pile up, to put the men on short time, or to close down part of its capacity. The first course is a nuisance and an expense, and both physically and financially

impossible beyond a certain point; the second too is possible only up to a point, for social and political as well as for financial reasons; the third is a most drastic step, inasmuch as a pit once closed is pretty well forfeited for good.

In the case of oil -- to take only one of coal's competitors -- the whole pattern is quite different, and a great deal more flexible.

The oil industry is capital-intensive: its capital costs represent about the same proportion of its total expenses as do wage costs in the coal industry. Most of these costs, incidentally, are borne out of the companies' own capital resources, in accordance with the industry's traditional policy of self-financing.

As well as its relative adaptability as to tonnages supplied, which it owes to its ability to some extent to regulate the volume of production or the flow of oil from the wells, the oil industry enjoys a certain flexibility in its price strategy.

This is due,

- firstly, to the very substantial financial charges which, unlike labour charges, can, up to a point, be spread over considerable periods;
- secondly, to the fact that a number of "linked products" are turned out alongside the actual crude: this means that, within certain technical limits it is possible to step up or down the respective proportions of the products obtained from the crude and at the same time, according to the state of the market and the competitive position, to pursue a price strategy making the most of the fact that the motor spirits have their market pretty much to themselves, whereas the fuel oils are to a great extent in competition with coal;
- thirdly, to the circumstance that the industry is made up of very large companies which generally control every of operation from production down through transport and refining to distribution, and which sell all over the world.

In the oil industry, therefore, not only can depreciation and profits be spread over a period and varied according to circumstances, but there is the additional advantage, from the point of view of competition, that it is possible to select the geographical area and the exact stage in oil's passage from the wells to the end consumer at which losses and profits should be recorded for the system as a whole to continue balanced and vigorous, and for petroleum products to compete to the full with other sources of energy.

And there is the further fact the rules of competition imposed on coal by the Treaty of Paris are not imposed on oil by the Treaty of Rome. The oil industry is therefore in a position to offer different terms to different buyers.

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This competition among the sources of energy, then -- intensified, as we have seen, by the technological revolution -- is a competition among sectors which for deep-seated structural reasons are unequally equipped to conduct it.

And if we turn from the technical and economic to the organizational aspect we find the same contrast. National reactions vary in accordance with the differences between the energy supply-and-demand positions of the individual countries, and so clash with the international undertakings which those countries have entered into for the purpose of establishing a single energy market.

B. National factors and international undertakings

1. National factors

The energy position of the individual countries

The complete change which has occurred in the energy position of Europe, the main feature in which, as we have seen, is the rapid rise of oil and relative decline of coal, has varied very considerably in incidence from one community country to another.

Proportion of energy consumption represented by oil and solid fuels respectively (in %)												
	Germany		Belgium		France		Italy		Luxemburg		Netherlands	
	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960	1950	1960
Coal	93.6	76.1	89.8	71.6	73.4	55.5	40.7	16.4	-	-	80.7	48.9
Oil	3.9	20.4	9.9	28.1	17.5	28.4	21.6	43.3	-	-	19	49.8
Oil 1960 1950	520%		285 %		162 %		200 %		-		264 %	

In 1960, oil accounted in Germany for approximately 20% of total energy consumption, in Belgium and France for 28%, in Italy for 43%, and in the Netherlands for close on 50%. Coal still represented over 75% in Germany, over 70% in Belgium, almost 55% in France, almost 50% in the Netherlands, and 16% in Italy. But to give a true picture of the current position these figures have to be viewed in the context of the tremendous change that has taken place over the past ten years.

From 1950 to 1960, oil consumption increased in Germany by 520% (admittedly from the very low 1950 level of 4%), and in Belgium by 285% (also from a comparatively low figure in 1950, 10%). France, the Netherlands and Italy, starting roughly equal in 1950 with 17.5%, 19% and 21.6% respectively, have shown increases of 162%, 264% and 200%.

These disparities both in the earlier energy positions of the different countries and in the pattern of change are one of the main factors explaining the countries' varying reactions to any given measure of energy policy.

A second factor is that the nature of each country's requirements and resources is such as to make it either markedly well supplied with indigenous energy, or markedly dependent on imports from third countries. Thus Germany was able in 1960 to cover 93% of its energy consumption out of home production, France 73%, Belgium 65%, the Netherlands 50%, and Italy only 46%.

Furthermore, some community countries are in process of constructing large capacity refineries which are making them more dependent on outside areas as regards both supplies and markets.

National reactions

The differences in the reactions evinced by the various countries are not due entirely to the differences in the patterns of supply and the degree of technological development in the use of fuels. There have been quite a number of contributory factors, which explain the manner in which each country has sought to handle the new situation with existing means, taking due

account not only of present considerations, but also of a sensitivity that has been moulded and fashioned by past experience and in part conditions judgment as to the future.

For instance, the presence or otherwise in a country of the headquarters of an international company concerned in the working of Middle Eastern reserves is not unconnected with such and such a type of reaction. Again, where a policy of prospection and production is being pursued, whether by the authorities or by private enterprise, the reflexes are not the same as where the policy is focused on the processing side or on international wholesale trade: as we go from one country to another we encounter a whole range of combinations between the position of buyer and the position of supplier.

Indeed within a single country there are conflicting opinions, regional claims, differing views as to what are lasting elements in the current situation and what are not. All this has resulted in different reactions, if not regarding aims, at any rate regarding means.

Thus in Germany the suddenness with which fuel oil invaded the market led, following the failure of the attempt to set up a coal-oil cartel, to the introduction of increased protection for coal, admittedly intended to be temporary: this provides firstly for a duty on imported coal (in excess of a duty-free quota), and secondly for a temporary tax on fuel oil. (Home oil production is also covered by tariff protection, likewise of a temporary nature).

The coal situation in Belgium is such that E.C.S.C. has had to "isolate" the Belgian market from the common market, under Article 37 of the Treaty of Paris. Even so, Belgium has also had to impose heavier taxes on fuel oil.

In the Netherlands, energy co-ordination has been made easier by the operating conditions in the coalmining industry, the types of coal produced and the absence of hydro-electric resources. In addition, the State controls part of the coalmining industry, and also the gas sector. The policy appears to be to develop a major refining industry, mainly focused on exportation and enjoying some degree of protection.

This is Italy's objective also. There the substitution of fuel oil for coal has gone further than anywhere else, though plenty of scope is also left for the development of natural gas and of hydro-electric resources. The taxes on fuel oils (the price of natural gas is linked to that of fuel oil) operate to some extent as a co-ordinating element as well as a fiscal device proper.

The most complicated case is France, whose energy economy is the most diversified. France has extensive coal and hydro-electric resources; it is the seat of a company operating in the Middle East; it is engaged on an oil-prospecting programme both within its own territory and overseas. No use is made of taxation as an instrument in this connection: the aim is rather to control the pattern of supply in respect both of oil and of third-country coal. Existing legislation furnishes the government with the means needed to ensure co-ordination, by recourse both to quantitative restrictions (quotas, etc.) and, in some measure, to action in respect of the price structure of the different competing products.

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2. International undertakings

This wide variety of national attitudes, due to the differences in national position, is, however, in contradiction to the requirements of the relevant international undertakings.

The object of the Treaties of Paris and Rome is to bring about the gradual integration of the national economies, in order to allow products to move as widely and as freely as possible.

The member states of the European community thus come up against the limitations imposed by the treaties, which vest powers in the various Institutions, within the framework of certain rules, and prohibit a number of practices which were formerly quite commonly resorted to under national policies.

As regards energy, the effects of the introduction of the common market are complicated by the fact that one source of energy, coal, mainly derived from within the European community, comes under the E.C.S.C. Treaty, while all the rest come under the Treaty of Rome.

A start has been made on dealing with the problem of the two different sets of institutions having responsibility for energy products, but there still remain the problems involved by the two different sets of rules applying to coal and to the other sources of energy. To take only one example, the E.C.S.C. Treaty is stricter in that the requirements it imposes on coal with regard to conditions of competition, and in particular to non-discrimination, have no parallel in the Treaty of Rome, which governs the oil sector.

Accordingly, under this rules and prohibitions, the member states have been deprived in advance, either in one sweep from the start or by fixed stages, of certain traditional means of action, and this at a time when rapide and radical changes are demanding rapid and radical adjustment. This is, indeed, felt to be unfortunate.

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However, the common market is not merely a matter of rules and prohibitions: it also affords a new impetus and new opportunities. These lie in the altered scale of the economy, which while adding to the problems of each individual state does at the same time demand a dynamic solution appropriate to the position of Europe in the world market. True, the treaties do not provide for new means of action in place of those they prohibit; true, they do not lay down even the skeleton framework of a policy, let alone a policy as such. But they do oblige the member states to review and adjust their policies in line with the new requirements and the new opportunities represented by the common market as a whole.

And so the question for the six countries, sharply highlighted by the changes now in progress, is this: are they resolved to accomplish what the economic potential of Europe shows can be accomplished, and are they able to accomplish it within the time-limits imposed by the progressive implementation of the prohibitions ?

In the ultimate analysis, then, the question is whether it is possible to reach general agreement on the outlines of a European energy policy and on the means by which the national policies may be subordinated thereto.

PART TWO

What is an energy policy ?

A theoretical approach to the rational framing of such a policy

In any economic policy it is necessary to set definite aims and secure permanent and effective means for achieving them.

Yet even at this initial point we find all sorts of misunderstandings as to both the aims and the means of an energy policy. Something must be done to clear up these misunderstandings, to dispel the prevailing vagueness as to what is involved, if energy policy is not to become simply the subject of purely verbal sparring masking bitter political rivalries.

You may feel I am straying somewhat into abstract theory if I go over these misunderstandings one by one. But this is the only way to arrive more or less at a common approach, by first drawing attention both to the extent to which most of these various conflicting views are in one way or another justified, and to the extent to which they are incomplete and inadequate.

It is necessary, therefore, to be abstract to start with, in order to come back to the concrete side afterwards with a sufficiently clear and detailed mental grasp of the situation to be able to take action in respect of it.

A. Determination of objectives

The aims and objects of an energy policy have been much discussed, a number of possible objectives, couched in general terms, being put forward, either singly or in combination. These include

- maximum cheapness with complete freedom of choice on the part of the consumer;
 - continuity and security of supply;
 - full employment;
 - maximum economic growth and maximum raising of consumers' standard of living,
- and others.

Schematically speaking, there are two extreme positions in the European community, the first explicit, the second rather implicit.

The proponents of the first thesis give priority to ensuring the lowest possible prices for energy: since they observe that low prices today are mainly those paid for imported energy, they urge that community coal should adjust itself to the price level of the competing imported products, even if in absolute figures, that could only result in a major contraction of coal production.

The second school of thought is in favour of preferential arrangements for community energy, for various reasons of which one of the most important is security of supply. Basing themselves on the same premise as to the disparity between the home and the imported prices of energy, they advocate energy policies designed to preserve a predetermined nucleus of European coal production (and also some degree of preference for European oil production).

But even if one of the proposed criteria is given pride of place, most or all of the others are practically advocated urged as well, as correctives.

But in point of fact until the criteria have been weighed one against the other, until has been specified which are expendable in the event of a clash, and to what extent, until some definite estimate has been arrived at of the tonnages and prices involved by the different alternatives, they are not themselves of much practical use for the concrete definition of an energy policy.

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1. Security of supply

The concept of security calls for very detailed analyses, clearly defining exactly what risks are involved and what would be a reasonable price to pay for precautions to reduce them -- in other words, analyses which would provide an indication of what would be a fair insurance premium against potential risks of this kind.

If we bear in mind that, roughly speaking, in ten years' time, with coal production at approximately the same level as now, Europe will have to import very nearly twice as much oil as it does today (280-300 million tons hard-coal equivalent, as against 150 million at present), it is obvious that security depends much more on the diversification of oil supply than on marginal variations in coal production.

What is odd is that the problem of security is for the most part specially emphasized by the coal-producing countries, which are the least affected, and minimized by the oil-importing countries, which ought to be the most worried about it.

Quite apart from the fact that Europe's own coal stocks are no doubt regarded as a common element of security, even by the countries which do not themselves produce any, these disparate reactions suggest that the views expressed with regard to security are usually influenced by the controversy between the coal-producing and the oil-importing countries, and correspond to differences of opinion as to the price of energy among the various countries of Europe.

In actual fact, the security problem is a real one. And it is pretty well equally a problem for the whole of Europe, which is bound whatever happens, at any rate until atomic energy becomes available on a major scale, to become increasingly dependent on imports for its energy consumption.

Once this truth is accepted, it becomes obvious that a number of safeguards are essential, with regard to such matters as supply zones, stockbuilding, proportion of multi-fired plant and so on -- all of which involve heavy expense, which would need to be adjusted and scaled to the nature and extent of the risks incurred.

When this problem of security has been clearly stated and dealt with -- that is, when the insurance premium has been correctly calculated -- it then remains to define the economic aim proper to be adopted for the purposes of an energy policy.

In general, the aim is to obtain supplies at the lowest possible cost.

This is, I think, fair enough. But it is no easy matter to define these "lowest possible cost". If we go at all closely into the concept, we find that it makes sense only if a long-term supply schedule is worked out first. And such a schedule, if it is to be a valid and accurate one, must take due account of a number of highly complex and in many cases chancy factors.

2. Working out the optimum schedule

Such a schedule must of course be based on an assessment of the future pattern of energy demand, as governed by a particular rate and type of expansion in the economy of the community in question (country or European community).

The optimum flow of supply in the long term will be that which makes energy available to that community at the lowest costs.

These costs are not, however, the costs ruling at any particular juncture in the market: they are the costs corresponding to stable and lasting long-term operating conditions. (Thus for instance they are not depreciation as actually written off, but depreciation as estimated over a long operating period; they are not the maritime freight-rates as quoted from day to day, but the cost of the normal replacement of the fleet).

In seeking to pinpoint such costs, therefore, it is necessary to plot over the years the supply curves for the various indigenous coals, for the imported coals, for oil, for gas and so on -- that is, the different amounts likely to be on offer at different prices at different dates.

These supply curves indicate as fully as possible the marginal costs of expansion and contraction of the various sources of energy concerned, for the community as a whole.

Needless to say, the supply curves will be accurate only to the extent that the hypotheses on which they are based are accurate. It is necessary that the prices so calculated should take account of all costs and all profits accruing for the community at the point of balance chosen between indigenous sources and imports.

Thus hypotheses as to the long-term prices of energy imports must take account of the long-term factors affecting the supply of the various sources of energy imported -- including the right insurance premium on these. For example, in the case of imported coal any attempt to work out the movement of American coal prices must take into consideration energy policy in the United States (focused, incidentally, more on oil than on coal), export demand, freight-rates and so on; in the case of oil, a hypothesis must cover the cost of prospection, the new investment needed, the cost of transport by sea and by pipeline, the possible reactions of the producer countries, the trend in world demand, and various other factors.

On the basis of these preliminary analyses, it will be possible to plot the supply curve for importable sources of energy. These curves must then be compared with the curves indicating the contraction costs of indigenous coal.

But in computing the contraction costs it is also necessary to take into account all charges or advantages to the community as a result of any contraction in indigenous coal production (charges in connection with re-employment of labour, area redevelopment, expansion of export industries to pay for additional imports of energy; advantages accruing from the higher labour productivity in the export sectors than in the coalmining industry, etc.).

In other words, the coal-producing countries have to assess both the cost and the value to them of their possible transition from the position of energy producer to that of energy importer, and establish the point beyond which the cost will in the long term exceed the value.

In particular, they have to work out the optimum rate for the process to go forward: the faster and the more unregulated it is the more it will cost, since the problems of fixed assets becoming obsolete and labour needing to be found alternative employment would thereby be aggravated.

The countries not producing coal of their own would obviously arrive at a different optimum, since they have no contraction costs to deal with in this connection.

To sum up :

The aim to be adopted in an energy policy is determined by the optimum long-term energy supply schedule for the community in question.

- Such a schedule is valid only if it takes account of all the implications, direct and indirect, of the alternative ultimately adopted as the optimum.
- For a given community with a given geological, economic and social structure, there can be only one optimum point of balance between national production and imported energy. That point is the one indicated by the correct weighing-up of all the profit and costs items (including the various risks to security of supply) involved for the community by the alternative adopted.
- As the position in the individual member States of the European Community varies very considerably from one to another, they have, quite understandably, widely-differing optimum supply schedules.
- The European community as such, on the other hand, has only one optimum schedule, which does not simply represent the sum of the schedules of the six member countries.

In seeking to establish an optimum energy schedule, then, it is necessary

- (a) to have the right perspective as to time factors;
- (b) to work on a level consistent with the aim in view;
- (c) to have the right perspective as to geographical factors.

3. Aspects to be taken into account in working out the optimum supply schedule

(a) Perspective as to time factors

The comparative tabulation of current conditions of competition as between national and imported sources of energy would be of value in working out a long-term adjustment objective only if the supply conditions for imported energy could be counted on to remain unchanged over a long period. It is however, quite hopeless to expect them to do anything of the kind, in view both of the changes which are likely to take place in the technical processes connected with that supply, and of the headlong expansion of world demand.

Moreover, the fact that the coalmining industry takes so long to adjust itself -- owing to the length of time required for investment to yield results and to the social complications arising in the event of contraction and redevelopment -- means that the basic decisions as among the various major alternatives have to be made well in advance.

Energy policy thus consists of present decisions focused on a distant future.

Furthermore, it is desirable that the terminal point of the period covered should each year be put back by one year, and the figures corrected in accordance with any fresh data throwing light on them.

(b) Level consistent with the aim in view

(i) The enterprises; the countries; the Community

The energy market, like all other markets, is the point at which buyers seeking to obtain the products most suited to their purpose at the most advantageous prices meet sellers seeking to obtain the highest profits on those products.

In theory at all events, therefore, the behaviour of every energy-producing or energy-consuming unit is governed by these objectives. And to the extent that economic operators have a consistent strategy they may be said to have an optimum economic policy on the matters with which they are concerned.

But a few examples suffice to demonstrate that the pursuit of this optimum on the basis of isolated and independent assessments is liable to entail costs to others, and to the community which are greater than the advantage expected by the individual economic unit.

Where the closure of a pit necessitates redeveloping a whole area, reorganizing its infrastructure, and providing relief and occupational retraining for the men thrown out of work, the expenditure involved may or may not yield an overall optimum. But to establish whether it can be considered to do so it is necessary to evaluate the costs and the benefits from the angle not of the enterprise, but of the community.

Equally and conversely, where the State, with a view to evening up competition between fuel oil and coal, feels it necessary to cut the price of motor spirit in the hope of inducing a rise in the price of fuel oil, it has to take into account not only the saving represented by a lower rate of decline on the part of coal, but also the increased expenditure on road construction and maintenance entailed by a rise in the volume of motor traffic (or else to take fiscal action to prevent the latter eventuality).

The national optimum, therefore, which represents the optimum organization of the whole country's energy resources in the long-term interests of the community as a whole, is not at all the same thing as the optimum market reactions of a particular individual economic cell.

This is of course why all the member States, acting in the interests of their peoples, have promulgated various laws and regulations concerning quotas, duties, taxes and so on. These are the instruments whereby the authorities are able to bring the behaviour of economic operators more or less into line with the objectives of the community as a whole. Where those objectives are properly chosen, and the means adopted are consistent with them and effective, there can be said to be optimum national energy policies.

Now these States have embarked, under the Treaties of Paris and Rome, on a series of processes of economic integration. But in consequence of the very different situation prevailing in each, their supply optimums vary enormously.

So a community energy policy may be defined as a policy which

- (a) by working out an optimum community supply schedule, will be clearly preferable, for the European community as a whole, not only to fragmented, empirical and inconsistent policies, but even to six national policies wholly consistent with six correctly interpreted national interests;
- (b) will secure ways and means of co-ordinating and amending the national schedule in line with the Community schedule.

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(ii) Energy and the general economy

Now here we are faced with a new and fundamental question. Even if we do approach the subject at the right level -- that is, the level consistent with the end in view, the national or the community interest -- are we entitled to discuss an optimum energy supply schedule as if energy were an end in itself?

For, of course, energy is not an end in itself. It is merely the means for developing an economy in the best possible manner, with the object of raising standards of living.

Consequently, the real problem in working out an optimum consists in weighing up the total cost of concentrating on maximum cheapness of energy supply against the beneficial effects of such concentration on the country's economic vitality, so as to determine the point beyond which the costs and the benefits on the national or the European plane would balance out over a long period.

Thus for instance attention will have to be given to the role, at once static and dynamic, played by the price of energy in the productivity of the different sectors of the economy. This role will of course vary from one sector to another according to the energy consumption of the sector concerned and its position in the general economy.

In France, for example, energy costs work out at over 10% of total expenditure for only five sectors out of some thirty, and some of those five are comparatively minor ones.

Again, the effect of changes in energy prices on competitive capacity in the export field, varies according to the nature of the exports and the amount of energy consumed in their production.

However, these examples show only the static side of the role played by energy in economic development. It is therefore necessary to analyse also the manner in which the price of energy influences the volume and choice of investment.

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In addition, to obtain a clearer picture of the implications of a given energy policy for the general economy, we have to compare the probable movement over a number of years of productivity in the coal sectors and productivity in those sectors whose exports would serve to defray the cost of importing the additional energy needed as a result of the decline in home energy production -- or rather, to put it more accurately, we have to analyse the long-term movement of the terms of trade as between the additional exports and the additional imports of energy.

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In short, to assess the respective merits of different possible energy policies and select the best, it would be necessary,

- first, to build a number of economic models some postulating
 - a large labour force in the indigenous energy-producing sectors, and other a small labour force in those sectors but a considerably larger one in the manufacturing export industries likely to find extensive and stable outlets for their products;
- and then to compare these various models (a) from the point of view of the general productivity of the economy and its rate of growth, and (b) from the point of view of the balance of external trade and of the terms of trade.

This analysis must of course be made in respect first of each community country separately, and then of the community as a whole.

For it is quite possible that a calculation which is correct for an individual country is less so for the whole community. This might be the case, for instance, if energy imports necessitated such a large increase in exports that it would be some considerable time before Europe could expect to secure, on a lasting basis, correspondingly large-scale sales outlets. Hence the competition which would develop among the different community countries in the export might affect the terms of trade for Europe;

- and finally, select the model likely to yield the optimum in accordance with the criteria adopted for overall productivity and growth, due account being taken (in line with the scale and speed of the resultant change from the initial position) of the cost of these changes to the community (contraction costs of indigenous energy, redevelopment costs, capital expenditure in the new export industries).

c) Perspective as to geographical factors

I have several times referred, in my account of the calculations for the determination of an optimum schedule for Europe, to the various interactions of the community and the outside world -- whether because the supply of energy is a world supply, or because the demand for it is a world demand, or because Europe's dependence on energy imports necessitates a world export strategy to pay for these imports.

I should now like to demonstrate to you that Europe's energy policy will have long-term consistency only if it takes account of this world context. I will take only three of many possible examples.

Example 1: the United States

It is most interesting to observe that the energy policies of Europe and the United States today are not once interdependent and contradictory.

A very eminent American specialist, Schurr, in a recently published study excellently brings out this dual aspect. He shows

- (a) that the low price of oil in the world market is largely the result of the protectionist policy of the United States;
- (b) that this policy of protecting home oil and restricting imports is largely based on considerations of security;
- (c) that the very liberal recommendations of O.E.E.C. concerning concentration in Europe on maximum cheapness of energy and the adjustment of coal to the import prices of oil are therefore based, firstly, on the deformation of the world market resulting from American protectionism, and secondly, on the standby reserves of American oil available to Europe in consequence of that protectionism.

I need not examine this example in further detail, but it is easy to see that, in view of the major position occupied by the United States in the world market, any attempt to base American policy on the approach recommended by O.E.E.C. for Europe would shatter the very foundation of European policy with regard both to prices and to security.

European policy must therefore take account of this eventuality, and must in any case accept that no energy strategy can be evolved for Europe without reference to the strategy of the United States.

Example 2: the underdeveloped areas

A second instance of the interlinking of Europe and the rest of the world from the point of view of energy policy is the situation regarding the so-called underdeveloped countries.

In the first place, a very large proportion indeed of Europe's oil supplies comes from such areas: something like 85 % of total European oil imports is from the Middle East.

In the second place, the accelerated industrialization of these countries (oil-producing or otherwise) will be the outstanding feature of the coming decades.

And these two facts raise a whole series of problems for long term European energy policy.

First of all, such a policy must take account of the delayed affects on the world market of the tremendous growth of the demand for energy on the part of the emergent countries of the outside world.

This aspect merits special attention. It might be that world demand for, say, oil would rise so steeply that there would be a real possibility of the supply failing to keep pace (at any rate before atomic energy became available in sufficient quantities to meet European requirements): if this is felt to be a genuine risk, then it should be taken into account in European policy forthwith.

If the oil market were to become a seller's market once more, the danger of the producer countries ganging up -- which is comparatively slight as things now stand -- would be a very formidable one. If this danger were to be taken into account now, both coal policy and, in particular, oil policy would certainly be affected. For the fact that oil supplies are concentrated in areas where admittedly the oil itself is cheapest but political and strategic insecurity is greatest, does undoubtedly add to the vulnerability of Europe. On the other hand, any diversification of sources of supply would mean that the oil industry had to spend enormous sums on prospection and to fall back on more expensive sources.

Not only, therefore, is there the problem of insurance against risks due to geographical factors, but also the possible further problem of insurance against risks due to time factors.

Moreover, oil royalties are coming to represent a preponderant proportion of the revenue of the underdeveloped producer countries. Europe will be obliged to import larger and larger tonnages of oil from them: accordingly, it is obvious that, in consequence of the resulting among intensified flow of trade, oil will stand out among all the basic raw materials as the linchpin of the change which is clearly destined to come over relations between the developed and the underdeveloped countries.

Only if Europe recognize in time the political problems posed by that change can it hope to enjoy security of supply. Having recognized them, it will then need to take speedy action to adjust the nature of its exports to the basic development requirements of the oil-supplying politically only if they are first transformed economically.

Example 3: Russian oil

Soviet oil exports to international markets increased nearly tenfold between 1953 and 1960.

Admittedly, their share of the world market at present amounts to no more than 2,5%. In the case of the European Community, however -- in contrast to the United States with its protectionist policy and to Britain and Canada with their deliberate restrictive practices -- Russian oil accounts for 9-10 % of total supplies, and in the case of some member countries for a good deal more (e.g. 25 % in Italy).

The increase on the volume of Soviet oil exports raises a number of problems.

Firstly, problems as to the tonnage likely to be available in the future: in view of its plans for the development of hydrocarbons (in liquid and gaseous form), the Soviet Union should before long be in a position to step up its exports considerably, the more so as oil is its ^{main} means of balancing its trade with quite a number of countries. And secondly, price problems: in order to gain a foothold, the Soviet Union is already granting rebates which are making conditions in the market even more unstable than they were before.

In addition, since the proceeds of Russian oil sales are used to finance the Soviet Union's imports of capital goods, this flow of exports and imports has a twofold importance for the European economy, by the provision of energy and by the new sales outlets offered to its industry.

The choice before Europe is therefore twofold.

- (1) Should each European country be left to negotiate agreements unilaterally with Russia, or should an effort be made to co-ordinate the commercial policies of the European countries vis-à-vis the Eastern bloc, so as to increase Europe's bargaining power in joint negotiations with the Soviet Union (which are bound to come sooner or later in respect of oil, as they have already taken place in the past in respect of other raw materials) ?
- (2) Russian oil exports will continue in any event. Is it best for the European economy and strategy that they should be absorbed mainly in Europe ? Or should Europe adopt protective measures and deflect them elsewhere ? In other words, would Europe rather allow Russian oil to contribute to the disruption of its energy market, or by protecting that market create more advantageous conditions for its own oil industry and enable it to meet Russian competition more effectively in third markets ?

Clear decisions will need to be taken on these various points before a European energy policy can be properly worked out.

B. Choice of means

After we have marshalled and analysed all the highly complex factors which must be taken into account in order to define the objective of an energy policy -- that is, after we have drawn up our optimum supply schedule involving the smallest cost to society -- we have to go on to settle what means are to be employed to achieve that objective by a steady, continuous process unbroken by sudden switches in the general economic situation.

One first question with regard to these means: does energy policy demand "liberal" means or "interventionist" ones ?

This may seem at first glance a doctrinarians' dispute, and in fact I think myself that, posed in these terms, it is a doctrinarians' dispute. But it underlies all the negotiations in progress, and so ought to be elucidated.

It is contended in some quarters that if free competition is allowed to prevail in the Community market, and the frontiers of that market ... thrown open, this will of itself produce a rational energy economy.

The advocates of this "liberal" approach base their arguments, explicitly, on analyses of the traditional economy and on the benefits of free competition. In addition, they express the fear that "interventionist" action tends to be designed mainly to preserve established positions and serves to impede necessary adjustments.

Their analysis is to my mind incorrect; their fears, on the other hand, I consider to be justified. For I do feel that, if energy policy is not based on a free-market economy pure and simple, it must make use of such market mechanisms as will keep competition active.

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The energy economy has a number of aspects which are in flat contradiction with the ideal of what markets and competition should be.

The energy market is oligopolistic in character. This is self-evident in the case of the oil sector (in which, moreover, the centre of gravity of the biggest oligopolies lies outside the Community). It is also true in varying degrees of the coal sector, inasmuch as coal production is very commonly to some extent centralized, and local marketing arrangements almost invariably so.

The legal and organizational framework within which the rules of competition operate is, as we have seen, very different for the different competing products.

True, something can be done to combat over-crystallization of the market, the development of monopolies or oligopolies. Something can be done to even up or harmonize rules of competition.

But it is no use hoping too much from action of this kind. For technical reasons, the energy economy demands a certain degree of concentration. Furthermore, whatever progress may be made in lining up the organisational rules of competition, we are still left with the basic problem -- not so much deriving from human behaviour as inherent in the nature of things -- of conditions of competition between two industries so totally different in structure. Competition between a labour-intensive and a capital-intensive industry, between a provincial, or at most national, and a world industry; between a main product and a linked product: between an industry which is not flexible enough to accept itself promptly to changes in the economic situation and one which is in a position to profit by them -- such competition is most certainly not of a kind to yield an economic optimum of itself.

If we further bear in mind, firstly, that we are seeking an optimum of the greatest possible long-term stability, allowing for changes which can be foreseen but are in many cases not yet apparent in the market and secondly, that, since investment in the energy economy takes such a long time to yield results, successful adjustment to future conditions must depend on decisions taken here and now,

it is even more obvious that the state of the market today is, in itself, no real guide to the optimum objective for an energy policy.

However, even though the market cannot, in view of its defects, be relied on to develop of its own accord towards the optimum, the object of the optimum worked out by other means must be to achieve the same aim as the market would have indicated had it been free from such defects -- an energy-supply pattern roughly corresponding to that represented by the sale of the different competing products at their long-term marginal cost.

In short, the structural conditions of the energy economy being what they are, the object of the exercise is to secure, by theoretical analysis and economic calculation, that rational set-up which should, but cannot, be produced by spontaneous reactions within the market itself. It is to pinpoint this objective that the attempt has been made to work out an optimum long-term supply schedule.

Having defined the objective, however, we must make every effort to eliminate the various forms of unco-ordinated dirigisme which are so closely identified with the operations of powerful interests seeking to safeguard or improve their own position in the market.

The mechanisms of competition, though not relevant for the purpose of defining the ultimate aim of energy policy, must be deliberately utilized as means of ensuring the achievement of that aim, by loosening up ossified structures and breaching resistance to change.

The object must therefore be to establish, by a general policy governing both tonnages and prices, a framework conducive to the achievement of the objectives of society. At the same time, within this framework producers and consumers must be able to exercise the fullest possible freedom of choice and to conduct the necessary competition with one another.

Such competition is the only force which can compel the energy producers to strive ceaselessly after rationalization and higher productivity. The producers are better placed than anyone to observe the effects of technological progress and background economic conditions on the probable movement of their costs at the different production stages, and so accurately to plan their activities in accordance with the probable prices of their competitors.

Similarly, the specific advantages of one source of energy in comparison with another -- convenience of handling, adaptability, cleanliness and so on -- can be accurately assessed only by the individual consumer, so that it is preferable to allow them to matter their own impact on the basis of a limited range of prices reflecting the long-term costs of supply.

The means selected for conducting an energy policy must therefore fulfil the following requirements.

1. They must serve to establish a general framework which will orient the energy economy in the direction of the objectives selected.

This framework cannot be described here in detail. It is made up of all the traditional instruments of economic policy available to the individual member States and the Community, namely commercial policy (tariffs and/or quotas), fiscal policy, transport policy, cartel legislation, the different social-security systems, credit policy, and so on.

The great thing is that these various means should be consistent with one another and with the objective in view. Also, the means employed by any one Community country must be sufficiently in line with those of the rest to avoid producing conditions of disarray or waste of resources in the Common Market.

2. They must operate primarily at the most sensitive points, i.e. those most vitally and lastingly affecting the orientation of energy policy.

In other words, the problem is to ensure maximum consistency in investment policy in the energy sector.

Whatever the purposes of the different investment programmes -- positive rationalization in the coalmining industry, the installation of refineries or pipelines -- it is absolutely indispensable to a harmonious energy policy that they should be consistent.

Here again it is necessary to define with care the exact degree of competition required, and the means of which the authorities, national and supranational, must avail themselves to prevent enterprises or industries from launching out in the wrong direction and wasting the resources of the economy in a manner likely to be costly to the community as a whole. (Such means may range from the liberal to the extreme interventionist.)

3. They must operate continuously, with the particular object of preventing disturbance by cyclical fluctuations.

Cyclical fluctuations affect the energy economy in an especially marked degree. This is due, as we have seen, to the structural differences between the various competing sectors. The chances of gain and risks of loss at times when general economic activity is high and low respectively are very different for indigenous energy from what they are for imported energy: coal, like all sectors undergoing a relative decline, is harder hit by any recession, and less substantially benefited by the ensuing recovery.

An additional reason is that certain prices deviate enormously from their averages according to the economic situation prevailing. This is so, more particularly, in the case of maritime freight-rates: for example, coal freights have varied in recent years by as much as 400 %.

Whether the remedy is to preserve standby capacity, or to organize anticyclical stockpiling, or to try to shift fluctuations in demand upon imports, or to seek to perequate prices as time goes on, or to do several or all of these simultaneously, I am not here concerned to discuss. What I do want to emphasize is that if anti-cyclical mechanisms are not set up to narrow the gap as far as possible between the exaggeratedly high or low figures ruling at a particular juncture and the average long-term ones, it is more than likely that cyclical fluctuations will constantly interfere with all efforts to achieve the aims in view.

The conclusion is, then, that, just as it is possible to work out an optimum for the aims to be achieved, so between the need to intervene in order to establish a framework which will serve to orient the economy and the need to maintain mechanisms making for active competition there is a point of balance which constitutes what might be termed an "organizational optimum" from the point of view of the community.

PART THREE

Ways and means of arriving at a practical
solution

This catalogue of the factors to be taken into account in working out a stable supply schedule involving the lowest cost to the community, and of the means to be employed to put it into successful effect, has perhaps seemed to you an abstract and somewhat discouraging exercise.

Nevertheless, it is undoubtedly an advantage to marshal the data which are theoretically necessary.

First, because in such a complex matter the great danger is that of asserting partial truths -- that is, of misleading one's hearers by leaving out certain points. The purpose of a general approach is therefore to make sure that the conclusion arrived at will not be invalidated by the omission of a remote yet vital factor, and also to reconcile various partial approaches which appear to conflict only because they fail to take account of one aspect of the problem.

Then again because it is only by arriving at an overall schedule that we can eliminate some of the uncertainties, get the measure of those which cannot be eliminated, and adjust our policy to allow for the points remaining in doubt.

And finally, because only by means of such a schedule can we estimate the benefits offered and the sacrifices entailed by the measures which are advocated, and try to work out such compensations as would make the sacrifices acceptable to those directly concerned;

At the same time, this catalogue has the disadvantage of perhaps suggesting -- erroneously -- that it is impossible to get over so many elements of chance and uncertainty and thus of giving a new lease of life to irrational, policies which are leading nowhere.

I feel it necessary, therefore, to demonstrate that some uncertainties can be disposed of, and that energy policy can and must equip itself to cope with those which remain.

A. Uncertainties can be disposed of.

Naturally, the remoter the future to which these relate the greater they are likely to be.

(a) Medium-term probability factors and moments of inertia

In the first place, it is clear that in the medium term -- say over a period of four or five years ahead -- there are various points which help to reduce the element of uncertainty as to the policy to be pursued.

Firstly, because certain measures are necessary irrespective of the ultimate aim adopted. The glaring disparity between the production costs of some collieries and those of their competitors is necessitating their rationalization (in most cases negative rationalization). This action is dictated by factors inherent in the coal economy itself, and almost unconnected with competition from other sources of energy and with the long-term prospects.

Secondly, in a field involving such heavy capital expenditure, such large numbers of individual workers and such closely interwoven interests, there are bound to be powerful moments of inertia determining the medium-term outlook. On the technical side, there is the fact that, notwithstanding improvements in the coke input rate, coke continues to have, thanks to the expansion in the iron and steel industry, an assured and calculable market (though there remains the question whether the coke in question is to be European or American). The rate of replacement of power-station boilers, railway locomotives and so on is also more or less known four or five years ahead. Even if the price ratios

were allowed to continue of a nature to encourage the substitution of fuel oil for coal, the rate of substitution would over such a comparatively short period remain within calculable limits.

In addition, the most serious uncertainties are further limited in the medium term by moments of inertia due to social factors, to resistance by existing interests and to the fact that these interests are very considerably interlinked.

Yet even though, in view of these various factors, the prospects for the next few years, and hence the immediate course of action indicated, are fairly clear, the fact remains that to base policy merely on these medium-term considerations would be exceedingly dangerous. For the elements of relative certainty and the moments of inertia become less and less as we look further into the future. And a policy which failed to take account of the conditions which may be expected to prevail with the weakening of the moments of inertia would be liable to result in the most serious miscalculations.

Immediate policy must not merely initiate action to secure a medium-term balance: it must orient the energy economy here and now so as to face its long-term development. Accordingly, it is also necessary to assess the long-term certainties and uncertainties.

(b) Long-term certainties and uncertainties

By analysing the long-term demand for energy, we can obtain a reasonably clear picture of the nature of the imponderables respecting the outlook for Community coal. It is evident that if the economic expansion of the European Community continues at approximately the same rate as in the last years the future of coal will largely depend on whether it succeeds in retaining the power-station sector as a regular market.

For even if competition from fuel oil did progressively deprive coal of the greater part of its past and present sales in the transport sector, in private households and in much of industry, still the growing demand from the iron and steel industry and the power-stations would, if met exclusively by Community coal, assure the latter of an outlet at least corresponding to, and very possibly exceeding, the present level of production. But if the power-stations were to resort instead to imported products -- American coal or fuel oil -- then obviously it would be impossible to market most of the Community's production of steam-raising coal.

Moreover, it may be wondered whether in many cases the loss of this market, since it would compel the producers to rely on coking coal alone to make a profit for them, would not send up the prices of these grades and so restrict its sales.

Hence the medium-term outlook for the major portion of European coal production would appear to hinge to a considerable extent on the power-stations' decision as to which fuel they intend to employ.

Obviously, the power-stations will always tend to seek the cheapest source of supply. So the element of uncertainty is once again shifted to the respective prices of the different sources of energy supply.

Here too we have a series of medium-term certainties, or at any rate probabilities, and of long-term uncertainties.

In the medium term it seems highly probable that the price ratios will continue such as to impair the competitive capacity of Community coal.

Even if the progressively intensified mechanization of the pits remains the order of the day, the pattern of costs in the European coalmining industry and the incidence of wage costs will change only very gradually. And since it is necessary to keep the allegiance of miners and to attract new recruits, it is fair to assume that the average wage offered by the industry could not -- at the least -- be lower than that obtainable elsewhere. What is more, the greater the rate of all-round economic growth (and unless there were such growth coal would not be able to secure its hoped-for outlets at all) the more this fact will apply -- particularly as the shortage of miners is already a real problem in a number of countries. It may be roughly estimated that average real wages in the industry will increase in step with the average rise in productivity in the economy as a whole.

Hence, even if the current improvement in productivity rates continues for some time to come, it is highly improbable that the average rise in productivity in the coalmining industry will by and large, and indefinitely, outstrip that of the economy generally. And therefore, in the medium term, the average relative price of European coal will certainly not go down, while in the long term it may be expected to go up.

On the other hand, in view of the position regarding the oil reserves, the modernization of the tanker fleet and the extension of the highly economic pipeline network, we have no reason to suppose that, in the medium term, the prices of petroleum products are likely of their own accord to rise so markedly and suddenly as to lose oil its considerable competitive advantage over steam-raising coal.

Further, short of a turnaround in the freight market -- which is improbable in the medium term -- the competitive position of imported coal also seems likely to remain extremely favourable.

The medium-term trends, then, seem pretty clear: they are economically unfavourable to Community coal.

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The problem with which we are left is whether the trend is a new, stable, permanent element to be taken into account in energy policy, or merely a phase in a cycle which may reverse itself.

Up to a very few years ago, Europe's energy policy was based on the expectation of shortage. The reversal was sudden and spectacular. It took place so swiftly and on such a scale as to provoke some scepticism, not to say sarcasm, concerning long-term structural forecasts. But the fact is, on the contrary, that the forecasts of the growth of energy consumption proved correct. What was miscalculated was the rate of substitution of petroleum products for coal, which worked out higher than had been expected largely because the extremely keen competition in the oil market led to a considerable decline in prices.

If the price ratios between European coal and petroleum products really do remain more or less permanently what they are today, then indeed this represents a radical change and energy policy will need to allow for it.

But it is permissible at least to query whether the present situation has come to stay. It would be unfortunate to assert that the forecasts of shortage had been made on the basis of one brief phase in a cycle, if in, say, ten years' time we were to find that the forecasts of glut had been a mere extrapolation of the conditions prevailing in another phase, though a slightly more protracted one. In particular, it would be inadvisable to allow the process of substitution to continue to its fullest logical conclusion simply on the strength of present price ratios, if there existed any reasonable doubt as to those ratios' long-term stability.

The imponderables from the point of view of energy policy therefore centre on the following questions: if we take into account; firstly, the tremendous increase in world energy requirements, as a result both of the economic growth of the advanced countries and of the accelerated industrialization of the rest of the world, and secondly, the additional availabilities represented by the emergence of natural gas and, in due course, what we may fairly expect to be the development of atomic energy.

- (i) how far will the world petroleum industry be able to respond with the requisite flexibility to the expected growth of demand ?
- (ii) is the present price level for petroleum products such as to provide the industry with sufficient financial resources of its own to cope with the expansion it will have to undergo to meet the extremely rapid growth of demand, or does it simply reflect the battle among the major companies and between them and the newcomers to secure as large a share of the market as possible ?
- (iii) is the present price level for petroleum products such as to enable the industry not only to undertake an adequate overall volume of prospecting and investment activity, but to locate that activity in a sufficiently wide range of areas to afford a reasonable guarantee that Europe's growing demand for oil will be consistently met ?

The energy requirements of the European Community in fifteen years' time will be in the neighbourhood of 800 million tons hard-coal equivalent per annum. It is obvious, therefore, that the problem of security of supply as such can be little affected by any marginal change in Community coal production. It is equally obvious that the outstanding problem of the coming decades will be security of oil supply. 85 % of Europe's present oil supplies come from the Middle East, where the costs of prospection and extraction are lowest. Is it reasonable to suppose that this proportion can be maintained without risk? And is it reasonable, either, to compare the present competitive capacity of the coalmining industry with oil price levels too low to pay for prospection in higher-cost areas?

In the final analysis, whether we opt for the one or the other of the two opposing policies possible, or for one somewhere in between, must depend on the answer to these three questions -- or the fact that it proves impossible to give any definite answer.

B. The alternative policies

This final analysis, then, serves to pinpoint both the alternatives open to us and the criteria for opting between them.

(a) The terms of the choice

The terms of the choice may be presented in skeleton form by outlining two opposing policies.

The first I can best describe as the "unsecured-bet policy". It might be based on the following argument: Europe can get imported energy today at lower prices than the energy it produces itself. It must make the very most of this opportunity, now. At the same time, it must adjust its internal energy production to the changed situation as quickly and drastically as possible. Those European collieries which are uncompetitive on the basis of

the present price ratio must be jettisoned. Financial assistance must be made available to expedite these closures, obviate undue social hardship, arrange for the re-employment of the workers concerned, and conduct redevelopment operations. Since European coal is out of the running for good, it must from now on be sold at the same price as imported energy. This will be the easier inasmuch as the industry will be more and more concerned to work only the best coal seams, while the collieries scheduled for closure will no longer have to spend money on capital schemes for the future. If even so European coal remains costlier than its competitors, then to enable the process of contraction to take place in an orderly manner it must be subsidized until such time as the industry is finally extinct.

This view is seldom propounded in its most uncompromising form, but it does in practice underlie many suggestions advanced daily. What it boils down to is that the same decisive choice should be made for European coal as Britain made in the last century for its agriculture -- and on which, incidentally, it ultimately had to go back.

If the advocates of the "unsecured bet policy" have properly thought out what they are suggesting, they must presumably be convinced

- (a) that the prospect of getting energy 20 % cheaper is a sufficient reason to determine European energy policy and
- (b) that cheap and plentiful atomic energy will be forthcoming before the risks of a turnround in the world petroleum market can materialize (or alternatively that the potential increase in availabilities is so great that no such risks exist), i.e.
- (c) that imported energy can definitely be counted on to remain permanently cheaper than European coal.

In short, this is staking everything on new technical capacities. Admittedly, twenty or thirty years ago nobody had any idea that improved prospecting methods would open up such immense reserves of oil as are becoming available today, nor that there were such possibilities with regard to atomic

energy. It may be that the future will see an as yet incalculable acceleration of the progress made in the recent past.

If the bet comes off, Europe will have the cheap energy of the future several decades before it otherwise would.

But if it does not, then the risk of economic waste -- -- with pits which would in fact have been profitable now closed for good -- and of political dependence is obvious and grave.

The second policy is based on the assumption that the glut of energy is not permanent. It may therefore be termed the "anti-cyclical policy". Its object would be to restrain a nucleus of Community coal production, to re-establish reasonable financing margins for the oil industry with a view to intensified and better diversified prospection, and to put forward the break-even date for atomic energy.

Once the marginal pits were closed, therefore -- which will be necessary in any event -- the aim would be to maintain coal production without a major quantitative contraction, by continuing to strive for the highest possible degree of rationalization and productivity, without however entertaining any great hope as to the possibility of restoring European coals competitive capacity vis-à-vis imported energy for so long as the price of the latter does not rise.

In essence, this second policy may take one of two forms.

The first would be, while still allowing a certain pressure for the purpose of stimulating rationalization, to introduce measures to shield European coal from excessive competition.

These might include import quotas, duties and excise taxes, severally or in combination. Whatever the measures adopted, they would have the result of raising the price of imported energy to a level enabling the European coal industry to market that volume of production which was recognized to be reasonable.

The second possibility would be to remove the price handicap by subsidizing European coal. This also could be done in a number of different ways, as regards both the financing of the subsidies and the selection of the beneficiaries.

The two possible main methods for a policy of support for European coal -- protection and subsidization -- are not mutually exclusive: they could be combined in varying proportions.

But we have to bear in mind that each of them is focused on a particular view of the future.

Subsidization, by which the prices of European coal would be artificially lowered forthwith in order to align them with those of imported energy, would not really be justified -- -- apart from offsetting abnormal charges -- unless there were reason to expect that the price of European coal would sooner or later go down to the prevailing level of import prices (or their future level should they drop any further). In these circumstances, subsidization would be temporary, transitional assistance designed merely to anticipate a development expected to take place in due time.

If, on the other hand, the justification for supporting European coal is felt to be the risk of a later rise in the price of imported energy, protection is the only logical possibility.

It would, after all, be somewhat inconsistent to allow patterns to emerge in Europe compatible only with an energy price which was itself by hypothesis expected to change sooner or later.

And there is a further important argument which supports this point of view. Even if a fairly considerable nucleus of coal production is maintained, the crux of the matter is still the problem of ensuring a sufficiently stable and reliable flow of imports to cover the tremendous increase in Europe's oil requirements. Now we have seen that action to do so would involve considerably increased costs for the oil industry, owing to the intensification of prospecting activity and, in particular, the very much greater diversification of supply areas which would be necessary. Any policy designed to aid coal, therefore, must be such as to avoid hastening a price-outlying war ruinous to oil.

The oil industry must be induced to help ensure greater security of supply for Europe; at the same time, it must be enabled to meet the extra financial burden this will involve on a sound economic basis.

(b) The criteria for the choice

Which of the two policies thus roughly outlined we finally choose -- the "unsecured-bet" or the "anticyclical" policy -- hence depends essentially on our diagnosis of the long-term development of the oil market. Our assessment of the implications for the economy of a marginal change in the price of energy, though useful in determining the technical means to be adopted to implement whichever policy is selected, cannot provide the criterion for the choice itself.

(i) It is admittedly very difficult to say today with any certainty what the degree of security and the price-level of oil imports will be in ten years' time; there are too many imponderables, technical, economic and above all political. It is not impossible, however, to assess the extreme implications, in logic, of the operation of favourable and unfavourable circumstances.

In other words, on the basis of the analysis in Part Two,

- (a) if the future could be fully known or made fully certain there would be only one optimum supply schedule, indicating one particular policy;
- (b) inasmuch as factors of uncertainty still remain after the most reliable information which it is humanly possible to obtain today concerning the future has been assembled and correctly analysed, it is necessary to work out the various schedules covering the various possible courses of events.

As each schedule will postulate the extreme values of the course of events concerned, it will show the extreme implications for Europe were those events in fact to come to pass.

These extremes may be considered to mark the limits of the "area of uncertainty" from which it would be possible to calculate the insurance premiums to be paid for a comprehensive "all risks" policy in respect of an uncertain future.

It would then be for the politicians to choose, on the basis of figures and with all the factual data at their fingertips, what premium they considered it possible to pay today in order to make the best possible provision against future contingencies.

In actual fact, it would appear that the choice does not lie between two such extreme policies as those I have described.

Notwithstanding the loss of geographical protection entailed by the extension of the pipeline network, the more productive European mines will in all probability remain reasonably competitive in the areas close to the seats of production and far from the major European coastal ports.

What has to be decided, therefore is whether it is economically right and proper to allow these areas in which Community coal is competitive to undergo a progressive shrinkage while broader and broader coastal strips are left to procure their coal from other sources, or whether a serious effort "should be made to maintain the outlets for the sale of Community coal in the contested areas.

In the latter event, it would then further have to be decided whether the drive to keep coal competitive in the coastal regions should take the form of subsidization (safeguarding the price advantages for coastal consumers) or of protection, or of a combination of the two.

Considering the volume (whatever the coal policy ultimately adopted) the Community's future requirements in imported petroleum products, the implications of the long-term problems should work out much the same for the whole of Europe.

It is understandable enough that the immediate interests of the coal-producing and the energy-importing countries should incline them differently with regard to the practical measures of protection and subsidization, and to the question of assessment and eligibility therefor.

From the point of view of practical politics it is sound enough that there should be this debate on the choice between protection and subsidization -- two possible means of action with different incidences on the methods of allocating a pro-agreed insurance premium. It makes for arrangements whereby the advantages and disadvantages of the various possible measures to each party would be equitably balanced, both with regard to energy as such and from a more general economic standpoint.

What is not so understandable is that these immediate interests should be accorded so much importance as to cause the producer and the importer countries to allow their short-term preferences to affect their long-term analysis.

It is particularly unsound from the point of view of reasoned analysis that this debate on long-term prospects and on the balance, from the political angle, between the advantages and disadvantages of the different methods of allocating the premium should have developed, in a disguised form, into a controversy on the role of energy prices.

(b) Without taking one side or the other as regards the substance of the point at issue, I consider it rather easy to demonstrate that to make this role out greater or smaller than it is furnishes only very dubious arguments either for or against a Community energy policy.

Let us suppose that our analysis suggests the role of energy prices in the economy to be a small one. In that case, the supranational authorities would be well justified in requesting those countries whose policies were resulting in major price disparities within the Community to help bring such prices closer to a common mean -- an essential prerequisite for a common market for energy -- by making sacrifices which would, on this hypothesis, be of little moment for their general economy, namely, by raising the price of imported energy or lowering that of internally-produced energy.

But, still on this hypothesis, the countries could retort that if energy prices played only a minor role, then disparities in this connection could not imperil the Common Market as a whole. Hence they would be tempted to let their own private considerations prevail -- the difficulty of carrying out an unduly drastic or rapid contraction in the coal sector, the presence of a large refining capacity needing its supplies and sales outlets assured -- and refuse to do anything at all to even out discrepancies in energy policy.

This would mean the triumph of separate national energy policies, at any rate for a long time to come. On our hypothetical hypothesis such policies would not jeopardize the establishment of the General Common Market.

But in point of fact they would interfere permanently with the operation of the Common Market for coal, and jeopardize the introduction of a Common Market for oil.

For even if we do allow that the price of energy does not vitally affect the expansion of the general economies, major disparities between the prices of the different sources of energy undoubtedly serve to intensify competition among those economies. So it is odds-on that the principle of freedom of movement would not be observed for long in face of the defensive and protective reflexes of the national sources.

Moreover, even if it could be demonstrated that the average level of energy prices is not of fundamental importance to the general economy, the fact remains that it is of fundamental importance for a number of large energy-consuming sectors, and for economically-handicapped areas.

So it is not merely freedom of movement that would be endangered: the coal-producing countries, with their higher energy costs, would undoubtedly feel compelled to adopt discriminatory tariff or subsidy policies in respect of certain consumer sectors and/or certain areas.

If this hypothesis were accepted, then, we should have continuing efforts to establish and consolidate the General Common Market, but at the same time a continuing set of separate national energy policies.

And if this hypothesis were accepted, that would be a logical schedule enough. But in that case it would need to be recognized right away that the logic of such a schedule would induce the individual countries to retain all possible means of their own for rationalizing their separate energy policies independently of one another.

Hence, if we were not to operate on a completely unreal basis, it would be necessary to amend the Treaties accordingly and concentrate the means available to the supranational Executives upon measures aiming at a structural long-term transformation of the energy market.

In addition, certain States whose own principle is to procure energy at the lowest price currently obtaining, and at the same time to step up exports of energy products to the rest of the Community, would have to recognize the contradictory nature of their policy. Since refusal to accept the mutual sacrifices involved by the establishment of a Common Market for energy must inevitably make it impossible to maintain free movement of energy, those States which have set up a refining capacity larger than is necessary to cover their own requirements would be obliged to make a fairly drastic reappraisal of their sales prospects.

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Now suppose we assume, in contrast, that the price of energy is pronounced to be of vital importance in economic expansion.

If this were so, it would follow that resistance to the unification of the energy market was better warranted from the point of view of individual national interests.

But the need to establish a Common Market for energy would be even more apparent. Major disparities in a sector definitely regarded as all-important would if allowed to persist, inevitably interfere more and more with the introduction of the General Common Market, especially in respect of products whose manufacture involves the consumption of large amounts of energy.

Thus the debate on the role of energy prices may lead either to the conclusion that a Common Market for energy is a minor matter but easy to establish, or to the conclusion that it is a difficult proposition but altogether essential.

Provided this debate is conducted with the requisite scientific thoroughness, it can be most instructive with regard to the best methods of arriving at a long-term energy policy.

In no circumstances, however, can it be regarded as a substitute for the economic debate as to the ultimate orientation of such a policy.

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CONCLUSION

The framing of a co-ordinated energy policy at European Community level involves a number of exceedingly complex factors. As the point of intersection of conflicting interests, it constitutes the test as to whether the necessary solidarity is present among the parties concerned.

But its complexity, despite appearances, is due not so much to technical factors as to the fact that it is an extreme case among the innumerable problems posed by the institution of a Common Market. Like the question of co-ordinating agricultural policies, though in a lesser degree, it threatens all kinds of long-standing traditions and firmly-set geographical patterns. But to a far greater extent than any other aspect of European policy it demonstrates the need for Europe to define its ultra-long-term position vis-à-vis the great world economies.

It is through whatever decisions are taken as to the energy policy to be adopted that the major questions concerning the future of Europe will be settled (or, as the case may be, left unsettled) -- long-term security of energy supply at lowest cost to the community relations with the big extra-European oil companies, interlinking with the energy strategy of the United States, establishment of a common, and hence strengthened, negotiating position for placing trade with the Soviet Union on a stable basis, adjustment of the patterns of trade with the underdeveloped oil-producing countries (including in particular the Arab countries) to the latter's development needs.

Further, it is through the debates as to the means to be employed in promoting an energy policy that the crucial problem of the European Community emerges in its clearest and most forcible terms: is the European Community to be simply

an arena for freer and broader-based competition, or will it work up the political will and the institutional means for a concerted economic policy to accelerate its long-term development? Since the energy market is undergoing a change that is nothing short of revolutionary, since in the field of energy more than in any other preparations for the future necessitate heavy capital expenditure and gradual processes of reconversion and redevelopment, will the European Community merely leave it to the operation of the market itself to establish day-to-day equilibria without giving some definite objective, or will it define its aim with all due deliberation, and take control of the mechanisms of the market in order the better to achieve it?

With such issues at stake, it is hardly surprising that the debate should be fierce, and progress slow.

The Institutions of the European Community are working to clarify the terms of the choice, negotiating with the Governments to develop the instruments which will be employed to put the ultimate decisions into effect. It is not for me to discuss these aspects today: I should be anticipating other speakers who have still to address you.

But the conclusion which dominates these studies and negotiations is already apparent; the establishment of a Common Market for energy is not in itself the definite solution.

Whether under the Treaties themselves or under inter-governmental agreements supplementing them, a strengthening of common policy on oil is the only means of safeguarding what has been done and pursuing what remains to be done with regard to coal.

On this issue as on others, Europe cannot afford that its forward march should come to a halt. If it does not advance into new fields, it will find itself falling back even in those which seem to have been won.