COMMISSION OF THE EUROPEAN COMMUNITIES

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A COMMUNITY PROGRAMME FOR THE PROMOTION OF INVESTMENT IN ENERGY

(Communication from the Commission to the Council)

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The Need for a Programme

1.1 For the period 1980-90 member states of the Community envisage investment of around 400 billion EUA, or up to 2% of GDP, in the energy sector. (See table at Appendix 1). On this basis, and assuming an annual average rate of economic growth of around 3.5%, Community demand for energy could by 1990 require the import of up to 100 million tons of oil per year more than at present.

1.2 Although there is as yet no real shortage of oil, tension on world markets has already reached the point at which the energy problem has become a limiting constraint on economic development. On present policies a genuine excess of potential demand over available supply is likely to develop towards 1990, with the risk of serious economic dislocation. The best insurance against these dangers would be for the major oil consuming nations to hold imports to no more than their current level at most.

1.3 For the European Community the extra investment in alternative fuels and energy saving required to meet this goal would be of the order of 50-100 billion EUA. Most of this extra expenditure would need to be committed early in the 1980s to yield results within ten years, and there will be a need for a continuing effort thereafter to ensure a sufficient growth in the availability of energy in the 1990's.

1.4 So the redeployment of only ¼ - ½ % of GDP into energy investment in the course of the 1980's would afford the Community a substantial measure of protection against a serious energy shortage by 1990. Measured against the political and economic dangers of such a shortage the scale of adjustment required within our economies is relatively modest and manageable. It could indeed have a stimulating effect, especially in providing employment.

1.5 Nevertheless, experience since 1974 is that although the rapid expansion of energy investment is essential in the public interest, opportunities and incentives at the level of the individual investor have been inadequate. Forecasts of future energy production have been steadily reduced during the last six years. There is therefore a need for a major political initiative to promote the necessary investment.

1.6 This note considers some of the reasons why energy investment has been slow to appear, and suggests how and where Community support is needed to remove these obstacles.

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Obstacles to Investment in Energy

2.1 The obstacles which prevent or delay energy investment in the Community include :

- Political and administrative obstacles,
- Difficulties in access to finance,
- Doubts about energy market developments,
- High first cost and long pay back periods,
- Technical risks.

2.2 Political and Administrative Obstacles. Some constraints on the development of energy resources are of a non economic character. In particular, the development of coal production and use, and of nuclear energy, is inhibited by problems of public acceptability which require these industries to observe very demanding environmental standards and impose costly and time consuming administrative procedures on new investment.

2.3 Access to finance has not in the past been a problem. Apart from the coal industry the energy industries have by and large been self financing, and present investment plans assume that they will remain so. But the need for improved efficiency in the energy industries will demand extra investment, for example in the collection of associated gas from offshore oil fields and the establishment of heat grids to distribute waste heat from power stations which could impose a strain when added to the need for conventional investment in production.

2.4 And the need for a rising level of investment by consumers in such areas as coal firing capacity, unconventional sources of energy such as solar heat, and energy saving will require the development of new channels of finance. In the case of households and small firms access to finance may be an obstacle that can only be overcome through Government grants or loans.

2.5 Doubts about energy market developments. Although the prospect of an oil shortage and the consequent increases in price provide a long-term incentive to investment in alternatives, the lesson of the last six years is that in the shorter run there remain large areas of commercial risk which deter the individual investor :

> The investment climate. The immediate effect of sharp increases in the cost of imported oil is to increase the rate of inflation and the cost of borrowing and to weaken business confidence. Economic growth may reduce to the point where there appears to be a risk of an energy surplus (e.g. in electricity production) which makes energy investment unattractive at the level of the individual investor. Economic recession means less investment by industry and hence less opportunity to install energy saving equipment in replacement of inefficient equipment.

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The price of oil. Most analysts now agree that OPEC has both the power and the will to sustain the real level of oil prices by reducing supply to match falling world demand. But until this is demonstrated in the market, the experience of 1974-78, coupled with political uncertainties in relation to the Middle East means that there is for the individual investor a wide margin of error surrounding any forecast of future oil prices. This uncertainty is made worse by Government policies which hold consumer prices of energy below true economic levels.

Complementarity of investments. Even if a secure market for energy is assured, the investor needs to be confident that supply will match the pattern as well as the overall volume of demand. In the coal industry, investment in new mines or transport infrastructure can only be justified if consumers make parallel investments in coal burning capacity. And the rapid penetration of energy saving techniques will require a balancing of incentives to consumers with the growth of investment in the manufacture of energy saving equipment, to avoid both bottlenecks and overproduction.

2.6. High first cost and long pay back periods. The table at Appendix 2 gives some rough estimates of the investment cost of various forms of energy. As it becomes necessary to mine and drill deeper, and employ advanced techniques for the harnessing of renewable energy sources, energy production (and some energy saving) becomes more capital intensive. At a time of volatile interest rates this creates problems for any investor, especially since the lead times for major energy projects tend to be very long.

2.7 For investment by consumers the situation is different. Analysis of the return on investment in solar heat or energy saving using conventional discounting criteria shows that this type of investment often compares favourably with conventional energy production and distribution, even without taking account of environmental advantages. But it calls for an initial outlay which may be twice as high as conventional forms of energy production ; thereafter the return on investment is assured, with minimal running and maintenance costs, but the pay back period may be longer than many consumers, especially in the domestic sector, can realistically envisage.

2.8 In fact, energy saving is perhaps the most promising investment of all. But though some simple techniques, such as roof insulation, have been cost effective at least since 1973, their use is not spreading quickly enough. Rising oil prices will help but Government and Community incentives are needed to maintain the impetus after the first 'easy' stages of energy saving and to ensure that the multitudinous individual private investment decisions are duly given a public-interest weighing.

2.9 Technical risks. Commercial risks are particularly acute for investors in advanced technology and novel engineering techniques. For the energy producer the margin of error in initial estimates of investment and operating costs is wide, and this is an important factor in the development of coal gasification and biomass, as well as for the generation of electricity from renewable resources. For consumer investments the main difficulty is that, as techniques improve rapidly, an investor may be wise to delay investment in the expectation of being able to acquire superior equipment at a later date ; similar considerations may inhibit investment in the manufacture of energy saving equipment.

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The Need for a Community Programme

3.1 While the required increase in investment effort could in principle be undertaken nationally, the scale of the problem demands a Community response. Planned levels of investment are not only insufficient, they are also very unevenly distributed within the Community. Natural energy resources, levels of energy efficiency, the ability to finance investment (at the same time as financing oil imports), and the political priority accorded to the energy problem all vary widely. But both because of the interdependence of our economies, and of the political weakness inherent in too heavy a reliance on imported oil, those countries which are strong in energy terms have a common interest with the weak in reducing the oil dependence of the Community as a whole.

3.2 A Community effort would have the political advantage over differing levels of national response of mobilising and sustaining, through the operation and development of a Community programme, a collective determination to overcome the energy problem.

3.3 The difficulty of finding a market in the new sectors where investment is required will diminish in direct relation to the extent of that market. Indeed, although Community intervention is needed to mobilise the necessary effort, the aim would be to create a climate of opinion in which the individual investor recovered confidence in the ability of the market to ensure the necessary levels of complementary investment.

A Community effort would also help to overcome the many uncertainties and obstacles in the way of investment in the new (and higher cost) energy sources to which we must increasingly turn.

3.4 The aim of Community policy would be to deal with all the obstacles that have been described, including those of a non-financial character. But if Community policy is to have a visible and coherent impact it must have a central element of common financial support.

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Areas for Intervention

4.1 The scale of the energy problem as it confronts the Community today is such that no potential source of energy can be ignored. Community support must therefore be organised in a way that recognises the variations in conditions both between and within member states, and provides the maximum incentive for the exploitation of local opportunities. For this reason it would be quite wrong to attempt a definitive list of areas where intervention would be appropriate. But it is possible, in the light of the analysis in section 2 above, to suggest certain priority areas where existing opportunities cannot be properly exploited without public support.

4.2 Energy saving. Investment in improved energy efficiency should be pursued up to the point of economic equivalence to the resource costs of investment in increased energy production. If account is taken of the wider implications, such as the benefits for the environment, a premium could be given to investments in energy saving. In practice the analysis in section 2 suggests that this type of consumer investment encounters obstacles which do not apply to the production of energy, and most member states have recognised that price incentives to save energy need to be supplemented by financial aids.

4.3 In the domestic sector the scope for saving, through techniques which are cost effective at current prices such as insulation, double glazing and more efficient appliances may be up to 50%. In industry, through recovery of waste heat and improved processes, 15-35%. In the transport sector, through improved standards for fuel efficiency and maintenance, and improvements in public transport, 25-35%. Improvements in technology and increasing energy prices seem likely to open up new opportunities as rapidly as existing ones are exploited.

4.4 A particularly promising area for the improvement of energy efficiency in the economy as a whole is the development of heat grids in which waste heat generated for industrial processes, and especially for the generation of electricity, can be distributed for district heating purposes. But the scale of investment required is very large, and beyond the immediate financial means of the traditional energy industries in the absence of public support.

4.5 New energy sources. A considerable research, development and demonstration effort is now under way and it seems likely that by the end of the 1980's techniques for the harnessing of wind, wave and tides, the generation of solar electricity, and the development of synthetic fuels from biomass will have reached the point at which commercial exploitation becomes feasible.
At the present state of the art only two techniques appear to be potentially commercial throughout the Community :

Geothermal energy is available in sufficient quality for the generation of electricity at a limited number of sites in the Community. But most member states have low temperature geothermal resources which are capable of development for district heating schemes. In addition to the considerations at 4.4 above there may be a need for public support to underwrite the geological risks.

Solar energy. Solar electricity has not yet reached the point of commercialisation. Passive solar heating (the designing of a building for maximum solar heat efficiency) is economic at present prices, but its rate of penetration can be no faster than the turnover of the building stock. Active solar heating is already economic for domestic water heating, and the difficulties and financing considerations are identical to those for domestic energy saving.

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At a local level, on favoured sites, other techniques may already be economic, though the limitation of the market dictates high costs. It is important that consumer investments of this kind should be encouraged irrespective of the general applicability of the methods involved, because of the development and demonstration effect.

4.6 Coal is the Community's largest indigenous energy resource, but development has been inhibited by competition from oil and gas, and from imported coal. There is scope for substantial investment in new mines and in the modernisation of existing mines ; both would improve the competitivity of Community coal and avoid over-reliance on imports whose price is likely to rise steadily. Fluidised bed combustion now permits coal to be burnt at higher levels of efficiency and lower levels of pollution than in the past. Coal consumption (indigenous and imported) in the Community could grow by between 30 and 40% during the 1980's, but this will require a coordinated investment programme covering production, transport and handling, as well as coal burning capacity.

Possible areas for Community finance include :

- Coal production to achieve higher productivity and lower long-term costs,
- Gasification and liquefaction,
- Construction and modernisation of coal fired power stations and conversion of oil and gas fired stations to coal,
- Conversion of industrial plants to coal,
- Transport and handling facilities, including port facilities for imports and intra Community trade.

4.7 Hydrocarbons. Although the economics of oil and gas production are favourable there is a need for investment which may be only marginally economic at current prices to extend the lifetime of Community resources. An example is the plan for a gas collection grid in the Northern basin of the North Sea with an associated cross channel pipeline. Similarly enlargment and extension of the Algeria-Italy gas pipeline would permit the consumption within the Community of gas which is at present flared.

4.8 Nuclear energy is not in general inhibited by financial problems, which ought in principle to be met by appropriate electricity pricing policies, but rather from political difficulties arising from the problem of nuclear safety. This being the case the possibility of Community support for demonstration projects, designed to overcome the opposition to nuclear energy in certain quarters, cannot be ruled out.

Definition of A Community Programme

5.1 It is too early to define in detail the scale and organisation of a Community programme. Since the aim will not be to replace but to supplement existing national efforts the first step would be to examine the scope for additional effort within each member state. But taking as an appropriate guide the assumption that extra investment will require, on average, public support of up to one third, and that Community expenditure would be matched by equal levels of extra national expenditure, the initial aim might be a programme with Community 'spend' building up to around 1 billion EUA per year, which would increase energy availability by around 6 million toe per year for each year of the programme.

5.2 Procedures. The political and psychological impact of the programme would be weakened if funds were simply dispersed through a wide range of unconnected projects. The aim would therefore be to supplement national programmes in line with Community energy policy objectives.
To qualify for support, investment programmes would be required to meet the following criteria :

a) The programme should contribute to the reduction of oil dependence and/or the energy/GDP ratio,

b) Public support must be required to overcome obstacles to private investment, or to bring forward that investment in time.

Support could take the form of grants, interest rate subsidies, or loan guarantees, and in some cases it might be appropriate for Community funds to be matched by equal contributions from member state budgets.

5.3 The procedure for the choice of programmes would aim to establish a link between the promotion of extra investment, the reinforcement of existing plans for energy investment, and the development of the policies of member states, especially in relation to energy price and taxation in line with Community objectives. The Commission would examine with member states the detail of their national policies with a view to identifying weak links and points of divergence from Community objectives, to choosing areas for further action, and to defining priorities.
In order to simplify administration, the management of programmes, once agreed in their details, will essentially be carried out by existing administrative infrastructures in member states.

5.4 The proposed measure of assistance for an increased investment programme would not reduce the need for a coherent energy pricing and taxation policy in the Community, as examined in COM(80)152 final, designed to avoid distortions and to create the right climate for private investment decisions.

2 annexes

Appendix 1

Estimated planned investment in Energy within the Community 1980 - 1990

	EUA billions	%
Solid fuel	26	6
Oil and Gas	106	26
- production	44	
- refining, transport and distribution	62	
Electricity production	148	35
- nuclear	112	
- other primary	5	
- secondary	31	
Electricity transmission and distribution	84	20
Energy saving	50	12
T O T A L	414	100
of which : primary energy	187	45

Appendix 2

Investment Costs

The estimates given below are for the investment required to provide extra energy availability of one ton of oil equivalent per year.

	EUA	
Continental shelf oil	170-250	
New coal mine	210	
Coal fired power station	400	
Coal liquefaction plant	600-800	
Nuclear power station (including fuel cycle investment)	660	
Geothermal power station	400	
Solar hot water	700-1300	Full installed cost including infrastructure
Geothermal heating	1000	
Energy saving (industry)	300-500	
Energy saving (domestic)	1000-1500	

Except where otherwise stated, these estimates are for <u>initial investment in primary production only</u> and are therefore not comparable with each other in terms of the value for money associated with each type of investment For example, in the case of coal production, to calculate the full cost it is necessary to add to the initial investment the labour costs (60% of full cost) and other running costs including fuel and maintenance, plus the costs of distribution. The latter are already provided for in national programmes, but to the extent that it might be necessary to scap existing oil related infrastructure and replace it with coal adapted plant, the switch to coal would involve additional costs. For an energy saving investment, at the other extreme, the exploitation costs are nil or negligible and the cost to the investor is offset for the economy as a whole by a reduced requirement for investment in energy infrastructure.

The mix of investments will of course vary with local conditions and opportunities, and there will be a tendency for investment to move towards the capital intensive end of the range over time, as lower cost investment opportunities are exhausted. For the purposes of this paper it is assumed that the average cost of increasing energy availability by 1 toe year lies in the range 500-1000 EUA.