

Investing to save energy

European File

In June 1979, at the request of the European Commission, a team of experts chaired by Jean Saint-Geours drew up a blueprint for a more energy-efficient society.¹ Another group, again chaired by Mr Saint-Geours, continued work along the same lines, concentrating in particular on a few key questions: what level of energy-saving is feasible in economic terms? what shape should potential investment strategies take? what will be their effect on employment? how can the necessary capital be raised? A summary of the panel's report is given below.²

Housing and services

Almost half the energy consumed in Europe is used in the home and in the tertiary sector (offices, shops, public works, etc.). Initial savings can be made by improving the design and use of lighting, and domestic and office appliances. But the key for potential savings lies in better insulation and more up-to-date heating systems. In theory, 50% of current energy consumption could be saved by the former and 25% by the latter.

- In old buildings, the most immediately viable alterations and expenditure — insulation of roofs and hollow walls, overhaul and regulation of heating systems — would already achieve half these potential savings. Is this sufficient or should the sights be set higher?

¹ See *European File* No 16/79: 'Economic growth and energy conservation'.

² Reference: 'Investment and employment in an energy-efficient society'; Doc. XVII/052/81 Final.

- In new buildings, increased savings can be achieved by tightening up insulation and ventilation standards, and ensuring that they are effectively applied, improvement of heating systems and use of 'soft' energies.
- The continued rise in oil prices heightens the attraction of other forms of heating: solar to heat water, wood, natural gas, electricity where nuclear programmes are advanced and coal where it is used in urban heating networks.

In the residential sector, energy conservation would have a very positive impact on employment. French and Italian studies for example, have talked in terms of the creation of between 40 000 and 80 000 jobs, depending on the hypotheses followed. But there are obstacles: many families, because they are short of funds, or simply because they are tenants, are reluctant to invest the necessary capital or tend to stop at the option offering the most immediate return. The profitability of investment is spread over one to twenty years. It increases with the cost of energy and appreciates differently depending how families and society in general see their interests (a lower level of imports could achieve the same savings, for example). The public authorities should therefore programme their efforts to take account of the wider public interest as well as coming into line with forecast economic and technological developments. They should intensify their support for investment and the spread of information to users, architects, designers, etc.

Industry and agriculture

Industry and agriculture together account for about 30% of all energy consumed in Europe. Particularly greedy (using 20% between them) are the steel, chemical, building, paper and board and glass industries, all sectors where the cost of energy relative to the value-added averages 15% and sometimes reaches 40%. According to some estimates, three-quarters of the potential energy savings in industry between now and the year 2000 (between 15 and 30% of its total consumption) are to be found in industries producing basic materials. In nine out of ten cases, new investment will be needed and in two out of ten new technologies. In the heavy industries, cutting down waste has already yielded a major proportion of the potential savings. But very profitable short-term energy savings are still to be made in the small and medium-sized businesses and in agriculture, whose energy bill could be cut by greater use of biomass (natural fertilizers, firewood, methane gas from agricultural waste, etc.).

Industrialists should take every opportunity to invest in energy conservation. For example:

- When they invest in maintenance or replacement of equipment which takes place almost automatically but at a very uncertain rhythm. Public aid could be needed to speed up conversion of boilers and heaters to electricity, gas or coal. The energy return of this equipment and of electric motors could be improved. Finally, heating pumps, renewable energy and the sequential use of energy offer attractive possibilities: heat from melting metals could be recovered and used to power turbines, heat workshops or houses. It could also generate the low temperatures required in the agri-food, textiles and paper industries.

- When they invest to cut costs, develop new products or increase their market share: a golden opportunity to switch to less energy-consuming raw materials, production processes or equipment. In all, some 30% of the energy used in the agri-food, consumer goods and wood and paper industries could be saved in this way. Significant savings could also be made in the steel industry (up to 15%) in the manufacture of chemicals (especially more sophisticated products) and in the mechanical, textile, cement and glass industries. However in a period of economic recession all industries face problems raising the necessary capital to invest.

Energy savings are generally the most profitable in industry. Nevertheless, the delay in getting returns on investment varies widely. The most 'lucrative' savings only correspond to between 1 and 5% of consumption. An extra reduction of between 5 and 40%, depending on the sector, takes between 4 and 7 years and the remainder requires an even longer wait. An important effort is therefore needed to encourage engineers and business managers to take increased account of the energy factor in all decisions, big and small, that they have to make.

The effect of increased energy savings on employment is more difficult to evaluate. New jobs would be created in the maintenance services and in the production of energy-saving equipment. But, on the other hand, there are bound to be cuts in employment in sectors aiming to boost productivity: a modernized production line may use up less energy but it also needs less manpower to run it. In the longer term, however, increased competitiveness would offer more of a guarantee to existing jobs and would mean more exports and therefore in due course the creation of new jobs.

Transport

Nearly 20% of all Europe's energy, over nine-tenths of it in the form of oil, is used in transport. Potential areas for saving energy are not hard to identify. Amongst the most obvious means are:

- wider use of public transport for passengers and goods, chiefly by employing more modern materials (lower-consumption aeroplanes, more competitive trains), better parking facilities and use of containers allowing easier transfer of passengers and goods from cars and trucks to rail and inland waterways;
- better traffic flow, leading eventually to the reduction of traffic volume by means of more flexible timetables and by encouraging employers to move closer to residential areas;
- above all, a number of measures connected directly with cars: better driver training, speed limits, stricter controls and maintenance of cars already on the road, use of higher-performance tyres and transmission systems, electronic checks on fuel consumption, research into new fuels (for example, ethanol from plant fermentation, battery-power, etc.). Between now and 1990 is a crucial period: European car manufacturers are developing a model that uses no more than 3 to 4 litres of petrol

per 100 kilometres. The speedy launch of this 'energy conscious' car is vital to the European motor industry. Its ability to keep pace with US and Japanese competition depends on this car of the future.

Clearing the way for innovation

Consumers — householders, car owners, industrialists and transport operators — are not the only players in the energy conservation game. Rational use of energy calls for a further two-pronged effort:

- An industrial effort: the growth in the market for new materials equipment and technologies should lead to a lowering of production costs and therefore an increase in the profitability of energy savings. This growth will of course depend on the spread of information and education to users, engineers, architects and so on, but also on the opening up of national markets and the dynamism of industrialists and providers of services. Will they be able to furnish consumers with sufficiently adaptable products and services? The public authorities could perhaps step in to promote profitable but little known energy-conservation techniques (regulation of heating systems, for example) to manage the growth in the market for home insulation, and finally to develop 'energy-auditing' services charged with identifying possible savings in the home and in small and medium-sized firms.
- A research and development effort designed to cut the cost of new materials and promote new energies: solar heating (which could be profitable by the year 2000), geothermic, wind and wave power. The exploitation of biomass and the biotechnologies also appear to offer good prospects. A good deal of research work needs to be done on motor vehicles, heating pumps and higher performance electric boilers, gasification and liquefaction of coal, production and storage of hydrogen (which could replace natural gas).

In both cases, increased participation by public authorities and better coordination at European level would enable quicker progress to be made and would ensure that European technology and industry could take on US and Japanese competition on equal terms.

Social research should also be stepped up. The full socio-economic implications of a greater or lesser degree of energy consumption are as yet unknown. The recession encourages reduction of the most obvious wastage, but it also slows down social change by instilling an attitude of caution and by limiting financial means, risk margins and investment capital. Other more favourable tendencies do emerge however as people try to organize their time and living space more efficiently: better organization of timetables and holidays, multiple use of equipment, land management, decentralization ensuring increased effectiveness to an extent that involves the population at large in the aims being pursued, and more frequent recycling of raw materials. Advances in the informatics sector could help in better controlling energy consumption (in heating, industrial production and road traffic). It could even lead to a reduction in consumption by replacing movements of personnel by exchanges of information between computers.

Investment: a political choice

Investment is the key to more effective use of less energy. To sum up:

- the most profitable investments – but those with the least immediate impact on jobs – are in industry and transport: improvement of the efficiency of heating systems, boilers and other machinery; substitution of electricity and coal for oil; modernization of production techniques; lower vehicle fuel consumption, by better servicing of cars already on the road and by the development of a low consumption car.
- in the residential and tertiary sectors there are other potential investments that are more immediately beneficial for employment, but whose profitability is medium term and whose implementation is more difficult because of the large number of individual decision-makers involved.
- further investment is vital to stimulate industrial and scientific progress.

Can a figure be put on the total investment effort required? Current investment in energy conservation in the Community amounts to between 6 and 7 thousand million ECU a year.¹ The Member States plan to spend 9 000 million a year up to 1990, though this could be as high as 16 000 million a year (not counting the 3-9 thousand million aimed at speeding up the replacement of oil by alternative energy sources). These investments are crucial: the potential for energy savings simply by cutting down waste is now almost exhausted in most cases. But collecting the necessary capital to invest is difficult: there is competition from the need for productive investment, economic growth in general has slowed, the battle against inflation is imposing very strict financial discipline, national budgets are burdened by low tax returns and by the weight of spending on unemployment.

Investment in energy conservation has, however, a comparatively minor impact on inflation: it cuts production costs and eases strains on prices and the balance of payments; it helps create jobs in low-inflationary sectors (such as construction) and in areas with good export potential (such as production of energy-saving technology); it helps strengthen competitiveness in industry as a whole and therefore its ability to export, maintain growth and create new jobs. It has been estimated that an annual European investment programme of 9 000 million ECU, half invested in the residential and tertiary sectors and the remainder in industry would create between 300 000 and half a million jobs between now and 1985.

How can new investment possibilities be exploited at reasonable cost? The public authorities can play a major role in this. It is a matter of choice and political coherence, but also of planning and depending on the case, of decentralization and European-level cooperation.

¹ 1 ECU (European currency unit) = about £0.60 or Ir. £0.69 (at exchange rates current on 20 October 1981).

The public authorities must promote:

- energy prices and tariffs that encourage savings. The cost of energy must therefore be realistic. Big consumers should not enjoy lower tariffs. Perhaps in the future prices should only vary according to the degree to which domestic energy resources are developed and depending on the greater or lesser rationality of use of a particular energy source in responding to the needs of different consumers.
- the inclusion of the public interest factor in energy policy decisions. Industrial strategy should aim to stimulate the development of low energy consuming industries, and particularly informatics, and encourage energy conservation in 'heavy' industry. National energy resources should be exploited to the full. Tax relief, aid and loans should be granted to families to lower the profitability threshold on energy savings in the home, credit facilities should be extended to companies, with priority accorded to developments which have the most favourable impact on employment. National programmes should be drawn up for insulation of old housing, for production and recovery of heat and for diversification of fuel (oil derivatives, agricultural ethanol, coal and liquid hydrogen).
- technological innovation. The principal means being: research and development aid, the definition of stricter standards, a rational public procurement policy, a major information and education effort aimed at researchers, engineers, businessmen, consumers, young people, etc.
- massive energy savings in the public sector, which should play a leading role and set an example. There is a wide range of potential public sector savings ranging from the houses it finances or runs to the materials it orders — where selection should be governed by energy needs.

But not all the responsibility lies with the national governments.

- Firstly, because local authorities are often better placed to take stock of the wide range of needs and resources available, to promote public transport use of renewable energy and to develop services and activities aimed at individual families. Private associations, voluntary groups and social workers can also play an important role in this respect. Chambers of commerce and regional banks can help small and medium-sized businesses dealing in energy-saving technology to identify their clients needs and to cooperate in meeting them. Producers and distributors of energy can help consumers to rationalize their use. In short, it is up to national governments to establish a framework which stimulates autonomous action and creativity amongst all interested parties.
- For its part, the European Community can ensure the increased efficiency of actions undertaken at national level, by offering a forum for debate and comparison of various national programmes; by defining common energy-pricing principles, by fixing performance standards for consumer goods — such as cars, heaters, domestic appliances — which are sold throughout the common market, by stimulating and

coordinating the research and innovative effort, by ensuring funding of energy-saving investments free from the budgetary constraints and problems often affecting Member States.

In all these fields the Community institutions already have a number of plans and proposals on which to draw.¹ The Community participates in the financing of scientific research (27 million ECU over the period 1979-83), demonstration projects likely to accelerate the development of new materials (55 million ECU between 1978 and 1981), of production and infrastructure investments (loans accorded by the European Investment Bank for energy savings and rational use of energy projects, have risen to a total of 151.6 million ECU in 1980 compared to 68.5 million in 1979).

But further steps are needed. Five priorities appear to be the most pressing:

- establishment of a Community procedure for the gradual alignment of energy costs based on transparent and realistic prices and tariffs;
- adoption throughout the Community of a minimum VAT rate for the sale of materials and services connected with the rational use of energy;
- harmonization of national aid for energy saving: alignment on the higher levels, simplification of procedures, decentralization of grants to householders, concerted programmes of aid to industry and also use of Community finances to eliminate distortions of competition, take advantage of the size of the Community market, accelerate progress in research and installation, whether of equipment, processes or renewable energy;
- coordination of action aimed at Europe's energy 'Achilles heel': petrol consumption by motor vehicles. This should include European-level agreement on a gradual reduction in fuel consumption, encouragement of research into low consumption cars and oil substitutes, development of the public transport network and better control of urban traffic flow.
- negotiation of European loans associating the oil-producing countries with energy conservation investment. Many oil-exporting countries have important financial reserves and are interested in any moves to regulate demand.

These then are the principal means identified by the Saint-Geours team to achieve energy savings without which lasting economic growth is impossible. The message these experts bring is not meant to alarm but to instil hope. It does not call for arbitrary restrictions but for imagination and participation from all interested parties. The message is that it is possible to live better by using less energy more efficiently ■

¹ See *European File* Nos 2/80 'New energy sources for the Community', 15/80 'European energy demonstration projects', 12/81 'Energy objectives for 1990 - where does the Community stand?'



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