

# BRIEFING

## THE INTERNATIONAL PERSPECTIVE

The International Energy Agency represents a number of the major industrialised countries. In this article David Jones, Director of Long-Term Co-operation and Policy Analysis at the IEA, considers the steps taken by member countries, including the UK, in the move towards energy efficiency and he describes the work of the IEA.

Today, the Member countries of the International Energy Agency (IEA)<sup>1</sup> have a surplus of oil, gas, coal and electricity. Why then is it essential to use energy more efficiently? For three reasons:

First, most energy resources are depletable. Inexpensive sources of oil and gas will diminish. Most forecasters agree that there is at least a possibility of tighter energy and oil market by about the end of the century.

There are many things which can be done to diminish this prospect. These include continued development of alternative energy sources to oil and development of new technology. But the application of financially and technically sound energy management practices will play a pivotal role.

Second, investment in the more efficient use of energy, provided that it gives a return comparable to, or better than, investment in energy supply, will improve the efficiency of our economies as a whole. It will save money for companies and individuals and will improve standards of comfort.

1. The IEA is an associated body of the OECD. Its member countries are: Australia, Austria, Belgium, Canada, Denmark, Germany, Greece, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

Third, there is wide concern about the environmental consequences of energy production and use. The best way of reducing these consequences, without lowering living standards, is to use less energy by using it more efficiently. Conservation in the 1970s and early 1980s was driven by the threat of energy and oil shortages. In the decades to come, it may be driven increasingly by environmental concerns.

For these reasons, energy conservation will remain a central issue on any national or international energy policy agenda.

### Progress and Prospects

Between 1973 and 1986, the energy intensity of the economies of IEA countries - that is the amount of energy needed to produce a unit of gross domestic product - fell by nearly one quarter, equivalent to over 1000 million tons of oil a year, or four times the oil production of Saudi Arabia in 1986.

This reduction was brought about by improvements in energy-using technology which were in any case occurring; by the rapid rise in energy prices in the late 1970s and early 1980s - average energy prices in IEA countries in real terms increased by 37 per cent between 1978 and 1982; and by strong government conservation programmes.

During these years, the relatively easy improvements in energy efficiency were secured. For this reason alone, the rate of improvement has slowed - a trend which has been reinforced by a weaker price stimulus and reduced government programmes.

At the same time, the need remains to retain the conservation initiative and exploit every economically-viable opportunity for improvements in the efficiency of energy use. So what can be done?

### Policies for the Efficient use of Energy

The potential for improved efficiency on an economic basis cannot be calculated precisely. However, IEA studies suggest that it is substantial, even at present low energy prices, and that the largest potential is in residential and commercial buildings.

Realisation of this potential depends largely on the efforts of those directly concerned. Governments can help by establishing a framework of policies which will promote the efficient use of energy. All IEA Governments have, to varying extents, done this. Elements of the policy framework are:

- removal of market imperfections which prejudice the efficient use of energy;
- pricing policies which ensure that consumers give proper weight to energy saving;
- setting standards - mandatory or voluntary - for the efficient use of energy in buildings, appliances and vehicles;
- information programmes, including energy audits, labels and guides;
- fiscal incentives to encourage investment in energy efficiency;
- encouragement of activities by non-governmental organisations - the energy industries themselves, the new energy efficiency performance industries and voluntary organisations;
- support for research, development, demonstration and dissemination of energy-efficient technologies;
- an example of efficient energy use in the government's own establishments.

Countries practise varying policies. A few examples of recent government actions are:

- The United States Government has removed or reduced market barriers to energy conservation, particularly price controls on oil and gas; set a legislative framework to promote



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combined heat and power; encouraged "least cost planning" which requires the electricity utilities to weigh the advantages of measures to reduce demand against investment in new supply; and established appliance standards and labelling.

- Canada has moved from reliance on massive Government conservation programmes to reliance on market prices; at the same time, the Government has done much to encourage arrangements under which energy service companies offer to finance and implement energy efficiency improvements in return for a share of the savings achieved in the initial years.

- Japan promotes efficient energy management by requiring establishments over a certain size to employ certificated energy managers. To encourage co-generation, the Electricity Utilities Industry Law was modified in 1987 to permit owners of buildings to supply electricity to users within a building. Preferential taxes and low interest loan financing were recently introduced.

- In April 1988, the Austrian Government presented its new "Energy Savings Programme '88", which will strengthen building codes and establish certain requirements for vehicles, electric heating and household equipment.

- Belgium has recently established energy performance standards for heating equipment used or manufactured in Belgium for export to other EC countries. The regulation also requires more detailed labelling, including information on efficient operating instructions, for steam boilers.

- Denmark has promoted combined heat and power and district heating through its heat planning process. Since January 1985, buyers of all residences must be presented with certificates approving the level of thermal efficiency or a report outlining the improvements needed.

The United Kingdom Government has relied on pricing policies which relate prices to consumers to the cost of supply supported in recent years by imaginative low-cost conservation programmes.

The establishment of a strong Energy Efficiency Office in the Department of Energy, the promotion of energy management, the support for voluntary groups, like Neighbourhood Energy Action, which insulate homes and the organisation of Ener-

gy Efficiency Year in 1986 are all examples which could also learn from others. For example, United States' experience in promoting the efficient use of electricity through the utilities could, even after allowing for very different circumstances, contain some lessons for the re-organisation of the UK electricity industry which is now under way.

The experience of a number of European countries in promoting combined heat and power and district heating could be relevant to the efforts being made to promote those technologies in Britain.

## What the IEA does

The IEA helps Member Governments to promote the efficient use of energy by undertaking analytical work, promoting collaborative research, development and demonstration projects and by providing for the exchange of experience and information. A comprehensive study of energy conservation policies in IEA countries was published in 1987.

Analytical work is now in hand on efficiency in the use of electricity and on energy conservation in multi-family dwellings.

Technology assessments have been published on heat pump systems, district heating and combined heat and power, microprocessor technology for energy use in buildings and fuel cells.

A thematic review, which studies as a single theme research, development and demonstration programmes in 12 IEA countries, is now almost finished.

Groups of IEA countries collaborate on joint research, development, demonstration and dissemination activities. These activities include data exchange, the construction of test facilities and international information centres.

We have current projects on advanced heat pumps, buildings and community systems, district heating,

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combustion, energy storage, heat transfer/heat exchangers, and high-temperature materials for automotive engines.

The information centre concept is especially suited to end-use energy technologies. The IEA Air Infiltration and Ventilation Centre and the IEA Heat Pump Centre have been operating for many years. They serve their members with newsletters and technical assistance.

A new centre was started in March 1988 in the Netherlands, called the Centre for the Analysis and Dissemination of Demonstrated Energy Technologies or CADDET, which will disseminate information initially on end-use technologies and eventually on renewable energy technologies as well.

Information on experience is exchanged at regular meetings of inter-governmental groups and special workshops. We held a Symposium on Energy Demand Analysis in October 1987 which examined analysis methods, data sources and survey techniques, as well as a range of specific issues, such as recent trends in transportation, fuel use and the response of energy demand to lower oil prices.

A workshop in Copenhagen in June 1988, organised by the Danish Ministry of Energy and the IEA, focused on combined heat and power and its companion, district heating. A workshop on conservation and the electric utilities was held in Paris in September.

## Conclusion

The extent to which conservation and other energy management efforts continue will be a key determinant of the energy situation we face at the end of this century and beyond. The IEA and its Member Governments place high priority on effective energy management efforts, but there is a limit to what governments and international organisations can do. The extent to which our countries exploit the opportunity for improving the efficiency with which energy is used will depend on consumers and on those, like builders, who are in close touch with consumers. It is they who must take the necessary decisions and actions.

*This article gives the personal views of the author and not necessarily those of the IEA or its member countries.*