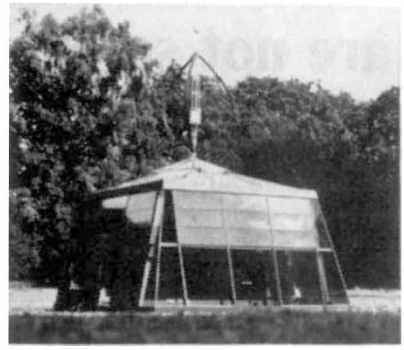
Solar energy in Britain



Solar collectors for heating

The UK Section of the Solar Energy Society has got off the ground with a bang. Eleanor Lawrence has been talking to some of its members about the report on the potential of solar energy for Britain now in preparation.

THE newly formed United Kingdom section of the International Solar Energy Society has set itself a formidable task in the first year of its existence. It is preparing on its own initiative an assessment of the potential usefulness of solar energy in Britain, along the lines of reports recently prepared in Australia and the United States.

A working party of some forty experts in the various branches of solar energy use has been set up with the help of a grant of £5,000 from the Wolfson Foundation under its programme to support research into the better use of Britain's natural resources, and the report on solar energy should be published in September 1975.

Although the outlook for solar energy in the gloomy days of a British winter seems on the face of it distinctly bleak, a measure of the interest in its possibilities, even in northern latitudes, is given by the rapid growth of the UK section since its formation early in 1974. It now boasts a membership of more than 450, second only to the North American section.

A definite check to research into the applications of solar energy in Britain was given earlier this year by the Central Policy Review Staff, the Think Tank, which recommended in its report on energy conservation that it would not be useful to increase government support for such research. One of the aims of the Solar Energy Society's report will undoubtedly be to try to persuade the government otherwise. By definition the members of the society believe that solar energy has a future in Britain in the short term, in the long term as a source of inexhaustible energy when fossil fuels are exhausted, and as one alternative to the large scale use of nuclear power. The problem as they see it is to pinpoint the areas of technology and basic research which can be most usefully developed to serve the special needs of a highly industrialised, densely populated country like Britain, with a climate which is far from ideal.

But there are ways in which solar energy could make an increased contribution to Britain's energy needs fairly soon, in providing supplementary water and space heating. The technology is available and there is already a small commercial solar heater industry in Britain. With the costs of gas and electricity all set to rise to 'realistic' levels, which will mean an eventual rise of some 30% in electricity prices, supplementary solar power, plumbed into existing hot water systems and suitably insulated, for water heating could become very attractive if it were relatively cheap and easy to install. One of the problems the report will have to consider in this context, however, is the feasibility of installing this sort of heater in existing buildings.

With regard to the longer term ideal of designing new houses and institutional buildings to take more account of solar radiation and perhaps incorporate solar heating devices, economics and social acceptability will probably be the main barriers, although there are still technical problems to be evaluated and overcome.

Many of the other applications of solar energy to be considered in the report are far more speculative. Solar energy research is nothing if not multidisciplinary, and architects and engineers rub shoulders with plant breeders and photobiologists. Green plants have solved not only the problem of capturing sunlight but also the vexed question of how to store the energy derived from it, a problem which is currently exercising the brains of everybody involved in the utilisation of intermittent and irregular sources of power.

The section of the working party dealing with agricultural and biological systems will consider plants both as a source of materials, including food, and as a source of fuel. Research is already in progress in Britain to breed and select plants which make a better use of the available solar energy through a longer growing season and an extended range of growing conditions. As to fuel, the fossil kinds represent a non-renewable source of solar energy stored by plants. So, the argument goes, why not use plants as a renewable source of fuel by converting plants and plant wastes to liquid fuels, gas and char by pyrolysis and fermentation. Problems the report will have to consider here are the availability of suitable plants, land and the technology needed for making use of the products. Plants grown for fuel may not necessarily have to compete for valuable land with plants grown for food, and it is here that research on the better use of available crops and the introduction of previously unconsidered types as food and/or fuel will be of prime importance. One of the main difficulties with any increase in the growing and harvesting of plants for whatever purpose will be the increased amounts of fertilisers needed. A major limiting factor is expected to be the availability of phosphate, a non-renewable resource produced by only a few countries. Recycling of phosphate and other non-renewable fertilisers is therefore an essential prerequisite before any such schemes can be put into operation. In the report prepared by the Australian Academy of Sciences, the long term nature of such work and the necessity for an early start on research was emphasised, a plea echoed by Professor David Hall, of the Department of Plant Science at King's College London, Chairman of the Agriculture and Biological Systems Section of the working party. If funds for such research are not made available very soon so that the problems and potentials can be properly identified, any useful contribution will take even longer to materialise than the twenty years envisaged by Professor Hall.

Similar considerations apply to work on the photochemical and photobiological conversion of solar energy. The study of the photosynthetic apparatus with the eventual aim of developing synthetic or semi-synthetic systems for using solar energy to split water to produce hydrogen in large amounts. say, has enormous long term implications but is threatened in the present times of financial stringency.

There is a greater industrial interest in photovoltaic solar cells because experience has been built up as a consequence of the space programme, but present terrestrial applications are limited to a few specialised uses as at present costs are very high. If components suitable for mass production could be developed costs would soon fall to economic levels opening up new possibilities for the generation of electric power.

Even if it eventually transpires that the potential for solar energy is indeed fairly limited in Britain—the Society's committee remains open-minded on this issue—Britain can hardly afford to miss out on the potentially valuable export market in solar technology. □

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