nature May 20, 1976

Is the Sun being oversold?

THE United States will spend £36 million in 1976 on solar energy research and development. Japan will spend £18 million, France and West Germany £3 million each, and the European Economic Community £2 million. Meanwhile expenditure in the United Kingdom will be less than £500,000. It that the right level, and if not, what is? The UK section of the International Solar Energy Society (ISES) has just published a major report (*Solar Energy: a UK assessment*, available from the Royal Institution, 21 Albemarle Street, London W1, 375pp, £10) which looks at prospects in the UK, attempts to predict the future for solar energy and tries to outline a research and development programme.

The Sun can be used for a variety of energy-related purposes: although heating applications with flat-plate collectors and electricity generation with solar cells are the best known, the report carefully outlines many other prospects. There is simply better building design, there are agricultural and biological applications of photosynthesis, including energy plantations and there are photochemical reactions; and within each of these areas there are many ingenious schemes, some of which work, many of which might, given appropriate investment of time, money and (dare we say it) energy.

The report is optimistic. It is supposed to identify areas particularly worthy of support, but after reading it one is left wondering whether anything is not worth supporting. Projects that are near to fruition should be encouraged; projects that are rank longshots should be encouraged; projects that are particularly suitable in Britain should be encouraged; projects with export potentials should be encouraged. Of course with nearly 40 scientists, engineers and civil servants collaborating enthusiastically in the report, it was unlikely that anything but an advance-on-all-fronts view would emerge, but even so the report does seem to suffer from a weak link in moving from scientific statements to policy recommendations. It is sometimes difficult to link the recommendations made at the end of each chapter to any very clearly enunciated argument within that chapter, and one suspects that the phrase "this technique could have export potential" has been added too often to have retained its credibility.

By the year 2020, the report argues, solar power could provide 35 million tonnes of coal equivalent of energy annually in the UK. It is almost impossible to estimate accurately what fraction of total energy consumption this might represent; it represents roughly 10% of present UK annual consumption. But elsewhere the report postulates that the contribution is 10% of 2020 needs, which is different, maybe by a factor of two. And one ever-optimistic Fleet Street correspondent persists in reading the figure as 30%. The report is not strong on its projections; it sometimes claims figures which are difficult, if not impossible, to find, but insofar as the projection of 35 million tonnes means anything, it probably implies that by 2020 up to 20% of all houses would be fitted with solar water heaters, and that there would be a significant contribution to our electricity supply from solar cells. (Solar energy could, of course, contribute in many valuable ways to isolated, local needs well before 2020.)

Do these predictions ring true? On the heating side they require, for instance, that in the next twenty years 0.5% of all present housing stock should be fitted with solar heaters each year. At a charitable £300 per installation and with the knowledge (not perhaps wide enough at present) that solar heating does not eliminate the need for a conventional heating system, one can only describe this prediction as hopeful. On the solar-cell side, the assumption has to be made that present costs of cells can be cut by a factor of a hundred to bring costs per watt into line with those prevailing in other electrical generators. The evidence for such a prospect seems tenuous in view of the lack of any spectacular progress up to the present in reducing costs. Further, the severe problem of cheap electrical storage will have to be confronted; the report rather lamely asserts that since the problem is receiving a great deal of attention and no fundamental scientific barrier is known to exist, "a breakthrough in the reasonable future may be expected". The same can presumably also be said of nuclear fusion.

And if solar cells experience all the required cost reductions, the land issue will have to be faced. To produce 10% of our 2020 total energy requirements from solar cells would require between 1 and 2% of the land area of Britain to be covered with solar farms (roads at present occupy a similar percentage). This is not a trivial fraction; the report asserts that the problem is "unlikely to be acute for many years as the use of solar energy will only develop slowly". But if and when solar farms do come, the size of the problem will be much greater than that of building superhighways through the country. To say, then, that solar energy is "particularly attractive in physical environmental terms" is simply to put off the day of reckoning.

The impression that the report leaves behind us is of a good survey of the science, but a loose job on the policy. This leaves the proposals for more national expenditure on research and development very exposed. ISES calls for £2 million in 1976, rising to £8 million by 1980 and £20 million in 1986. Very crudely, this would compare, in the early 1980s, with British plus EEC expenditure on fusion research. There is a real danger that over-optimism now may cause resistance to even a fraction of such money being made available later. □

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