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Solar Power in the Middle East

The richest Middle Eastern oil state is seriously considering a major program of solar development. There is talk of Saudi Arabia becoming the world's first "solar economy" and of "using solar power to make the desert bloom."

The motivations behind a major Arabian solar effort would be diverse. The Saudis are acutely aware that their petroleum stocks are finite. They genuinely lament the explosive projected demand for oil as fuel and would welcome an alternative energy source which could serve to stretch their oil supply over a longer period. Global leadership in solar research could lead to continued Saudi importance in global energy affairs.

There also seems to be a genuine Arab desire to help their Third World sister-states. The Saudis committed about 13 percent of their 1974 gross national product to foreign aid (compared to 0.25 percent for the United States). Many of the world's poorer countries lie in geographical areas of high solar flux. If a major Arab solar effort is embarked on, if progress is made in reducing the dollar cost and initial energy investment in manufacturing solar devices, and if this technology spreads around the equatorial band, the future geographic distribution of global economic activity could be significantly influenced.

Most of the current energy demand in nonindustrialized countries is for low-grade heat. At present this energy is typically released from the combustion of firewood and animal dung—both of which are in short supply. Indeed, the "firewood crisis" exacts its toll from more of mankind than does the oil crisis.

Mass production of inexpensive solar stoves could substantially reduce the demand for firewood. Solar hot air systems, useful for such purposes as space heating or crop drying, are being adapted to local conditions in many countries. Solar water heaters are already common in Israel, Cyprus, India, and Japan.

Solar water pumps have been available in the desert regions of the world for decades, albeit at high prices. Frank Shuman built a 55-horsepower solar irrigation pump near Cairo, Egypt, in 1913. Today the governments of Niger, Mauritania, Senegal, and Upper Volta are operating solar pumps, in hopes that this technology may eventually help stem desert encroachment.

Such inexpensive, elementary solar technologies could play an important role in the Third World. What has not been so well recognized, however, is that the development of sophisticated solar technologies capable of providing economic high-grade energy may have far-reaching implications for development patterns. Much of the global South has a greater solar potential than the industrial North. The ground-level solar flux in Saudi Arabia is roughly twice as high as in the contiguous United States.

Progress has been slow in the development of competitive solar devices to provide high-grade energy. But this situation is changing rapidly. Proposals for mass-produced photovoltaic cells, solar thermal electric farms, bioconversion plantations, and wind power generators are no longer dismissed lightly.

Funding continues to be the central problem. Solar research has multiplied fivefold in the United States over the past 2 years, but solar technology remains among the lowest-priority items in the nation's energy budget. This fiscal year's federal outlay for fission nuclear research will be $678 million; for fusion it will be $147 million; for fossil fuel research it will be $253 million; and for solar it will be $25 million, up from $9 million last year. (Next year's U.S. solar budget should be larger, reflecting the field's new political credibility.)

Technical research has tended to be limited to the highly developed nations, all of which are in the temperate zones. The recent spread of vast oil revenues to otherwise poor desert countries may change this pattern. Several Middle Eastern states have been contracting with American and European institutions to develop new research "centers of excellence" in that region. This development can be expected to lead to an increased research emphasis on topics of equatorial concern. There could be no clearer indication of such a shift than the funding of a major solar effort, designed to meet the needs of the global South as well as the North.—DENIS HAYES, *The Worldwatch Institute, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036*