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## Push solar energy, not nuclear

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**N**uclear energy is costly to install, full of risks for operation and maintenance, and too costly to de-commission. (That is why there was no response to Thatcher's call for bids in her effort to privatise U.K.'s nuclear power plants). But why bother to erect such nuclear power plants when limitless energy is freely available from the gigantic fusion reactor, the sun?

According to a recent report of the United Nations, solar energy falling over an area of 800 km x 800 km harvested with the currently available technology is enough to meet the energy needs of the whole world (The *Hindu*, June 7, 2006). The solar energy radiation falling over India is estimated to be about 5,000 trillion kWh a year.

Assuming a population of 15 billion in 2025, if even 1 per cent of this can be harvested, it will provide about 90 kWh a day per capita, which is more than ample. And there is almost unlimited scope for evolving better solar energy harvesting technologies.

Ever since the dawn of civilisation, mankind has depended on the photosynthesis-biomass route to harvest solar energy. But now a stage has been reached when any further "progress" along this route is fraught with the great danger of global warming, climate change and consequent disasters.

Hence the need to consider other technologies for harvesting solar energy. Solar photovoltaic technology is such an alternative. In fact, German politician Hermann

Scheer, winner of the Right Livelihood Award, has made out a convincing case for mankind to change over from "fossil fuel economy" to "solar economy" in his book *The Solar Economy - Renewable Energy for a Sustainable Future*.

The advantages of solar photovoltaic energy, particularly for India, are fairly obvious. It is inexhaustible and readily available almost all over the country all round the year. It is clean and non-polluting. It has no moving parts and involves negligible running costs. It is amenable to decentralised generation at the points of consumption, not only eliminating transmission losses, but offering many socio-economic benefits by empowering families and communities to be self-reliant for their energy needs.

The paradigm shift from fossil fuels to solar photovoltaics is not a Utopian fancy as it may seem at first sight. Already, all the satellites in outer space on which the vast majority of mankind depends for communication, entertainment, weather forecasting, etc., are powered by solar photovoltaic arrays.

This writer knows a family of farmers in California who have totally "solarised" their small farm. Every building in the farm has enough solar panels on its roof to meet its energy needs. And they have been able, within three years, to recoup 50 per cent of their capital expenditure on solar photovoltaic (SPV) installations, in the form of savings on grid electricity bills. In our own country, as on December 31, 2005, 13,00,000 SPV systems with an aggregate capacity of 245 MW are functioning.

However, there is a flip side to this rationale. The cur-

rently common silicon-based SPV panels are costly. They have a conversion efficiency of around 10 per cent. Their manufacture is highly energy intensive, needing about 10 watts of electricity to create one watt of SPV capacity. There is also an acute shortage of pure silicon. They need costly batteries to store the energy.

But these are the problems which determined research can solve. In a speech last year our then President A.P.J. Abdul Kalam said that with carbon-nano technology it is possible to develop solar cells with a conversion efficiency of 50 per cent. If SPVs are made the main thrust area of energy development, it is likely that their costs will come down dramatically as happened in the case of computers and mobile phones.

In such a situation, India can set up a Solar Energy Commission on the lines of the Indian Space Research Organisation with a clear mandate to achieve a clearly defined target (say/substituting 50 per cent of the country's fossil fuel consumption by solar energy, within ten years). Second, set up a large, number of factories to manufacture SPV panels with the best technology available.

Make it mandatory for large houses, buildings and factories to create standby/fallback energy capacities to a prescribed proportion of their total energy consumption either by SPV panels and/or biogas plants which will process biodegradable solid waste created on the premises. All panchayats and towns should be asked to set up biogas plants as the Kadakkal panchayat in Kerala and the Namakkal municipality in Tamil Nadu, to convert solid waste into energy.