

India should tap solar power for thermal plants

SUNLIGHT: ECO-FRIENDLY ALTERNATIVE

Solar power plants are the cheapest option available.

	Coal-fired plants	Coal-fired plants with 75% geo-sequestration	Nuclear plants*	Solar tower*	Combined solar tower and photovoltaic panels*	Wind farm
Capital expenditure per MW capacity (Rs crore)	6.85	21	22	25	20	34
Annual recurring costs per MW (Rs crore)	6.5	10	10	1.75	1.5	4.5
Cost per unit (kWh) of power generated (Rs)	7.5	12.5	12.5	2.5	2.0	6.5
Polluting	Yes	Yes	Yes	No	No	No

Source: www.unenergy.org

*2009 estimates

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The government is determined to push reforms in the power sector at full speed. On the agenda is clearing as many proposals as possible to set up thermal power plants and nuclear power generation capability. That is good news.

But recent studies appear to suggest that solar power may still be the

best way out. In fact, as 'The Economist' points out in its latest issue, California-based **Brightsource Energy Inc.** recently signed the world's two largest deals to build new solar power capacity. The deals involve 14 solar power plants that will collectively supply 2,600MW of power, enough to light 1.8 million homes.

Instead of using the conventional photovoltaic route, this company specializes in "concentrating solar-thermal technology", in which mirrors concentrate sunlight to produce heat. This heat is then used to create steam, which in turn drives turbines to generate electricity.

The chart shows some of the high-

est capital costs for all types of power-generating facilities, which could be between 30% and 40% higher than the costs for plants that have been cleared on the basis of international competitive bidding.

The only factor that appears to go against solar power is the capital cost involved per MW of power generated (in sharp contrast to per MW of installed capacity). But on a per MW basis, solar power requires less capital expenditure than hydropower and wind power.

Interestingly, the time taken to set up a solar plant compares well with the time taken to set up either thermal or wind power plants. Hydropower plants, in contrast, can take several years to set up.

But what makes solar power most attractive is the cost it takes to generate each unit (kWh) of electricity. Even if one accepts the high capital costs (inclusive of interest costs and labour), the tariff would be less than Rs2.50 per unit. You also have the benefit of a non-polluting facility.

And since solar towers use steam, which coal-fired thermal plants also use, it would make sense for Indian engineers to work out ways to convert some of India's coal-fired turbines into solar (steam) power turbines. That way, existing assets could be used to switch over to a new technology that is both consumer and environment-friendly.