

MULTI-CRITERIA SUSTAINABILITY ASSESSMENT OF COAL AND SOLAR POWER GENERATION IN INDIA

India has embarked on an ambitious program to expand solar power plants to a total installed capacity of 100 GW by 2022. Most people assume that electrical energy from a coal power plant is less expensive. In this study, Mitavachan and Srinivasan compare coal and solar power generation with respect to a set of seven sustainability criteria. The analysis shows that electrical power from solar plant is more affordable than power from coal. Further, it is observed that solar power is far better than power from coal when environmental extend such as global warming, air pollution and water footprint are considered. The study estimates that coal power plants emit 23 times more greenhouse gas emissions, cause 28 times more air pollution, consume 40 times more water

and lead to 15 times more external costs to society than solar power plants in India. Further, both the power sources are comparable when seen from land transformation, land occupation and levelized costs (LCOE) perspectives. It is only in reliability that solar power plants with 16-24% capacity utilization factor (CUF) lose out to coal power plants which have 50-74% CUF. This study highlights the importance of decision making in the Indian energy policy arena based on multi-criteria assessments employing life cycle perspective.

Reference : H Mitavachan and J Srinivasan, Multi-criteria Sustainability Assessment of Coal and Solar Power Generation in India, **Current science (In press)**

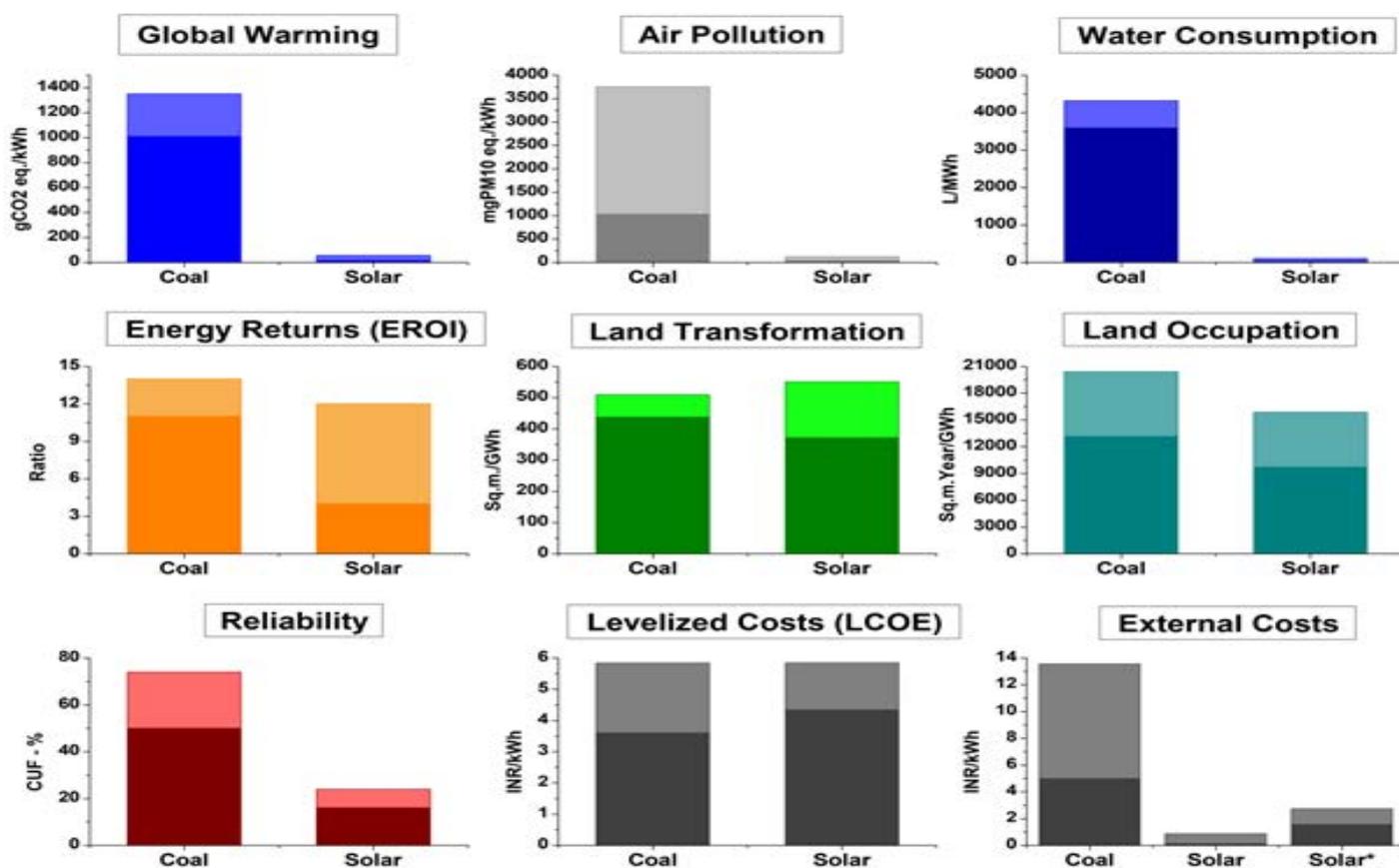


Figure: Comparative performance of coal and solar power generation with respect to different sustainability indicators in Indian context. The lighter shades represent the higher bound values.