

**Article title:** Challenges and Opportunities for Solar Tower Technology in India.

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**Abstract:**

Solar Tower technology has gained considerable momentum over the past decade. Unlike the parabolic trough, Solar Tower has a lot of variants in terms of type of receivers, working fluids, power cycles, size of heliostats, etc. Most of the literature available on this technology does not address in great depths, details of various parameters associated with tower technology. A detailed examination of plant parameters is required in order to perform a potential assessment, design basis or feasibility analysis. This paper aims to assess the principal parameters of existing plants, namely, solar to electric conversion efficiency, mirror and land area per MW<sub>e</sub> of equivalent capacity, packing density, field layout configuration, receiver size, tower height and gross costs of plants, wherever data is available. Based on this global review of existing plants, it is observed that, the annual solar to electric conversion efficiencies has an average value of 16% and the packing density has an average value of about 20%. Since most of the existing plants have been constructed for demonstration purposes, the true potential of this technology has not yet been realised. Using this assessment as a basis, the technical, financial and policy drivers and barriers for adopting tower technology in India are discussed. It is seen that based on indigenisation prospects, tower technology with external cylindrical or cavity receivers with storage could be adopted. The role and significance of this technology is brought out in the context of the Jawaharlal Nehru National Solar Mission (JNNSM) in order to achieve grid-connected solar power. It is estimated that around 1800 MW of grid connected Solar Tower plants could come up under this mission by 2022.