

Multi-tower solar array

Photovoltaic technology is the most popular means of converting solar radiation into electricity. Typically, PV units are set up in small units or with large concentrating solar power (CSP) plants utilizing heat engine generators such as parabolic trough plants or solar towers. However, neither of these systems has an installed capacity comparable with the output of conventional power plants or other renewable energy systems such as wind power.

Multi tower solar array (MTSA) is a new technology, similar to CSP units, which can be built either as a large- or small-scale solar power plant with more efficient ground area usage, due to its overlapping heliostat fields. MTSA can be set up as a modular system, which can be built step by step or retrofitted into existing plants. MTSA can be regarded as a group of solar towers where the heliostat fields of the towers partly overlap. Heliostats more distant from the towers are alternately directed to more than one tower, depending on the mutual blocking and shading of the reflectors. This leads to a high annual ground area efficiency, with high density of heliostats compared to a single solar tower system where radiation losses are higher because of smaller ground coverage or the mutual blocking of the heliostats, when set up with a higher ground coverage.

MTSA technology is expected to fill the gap between small PV systems and large CSP plants. Additionally, MTSA can be integrated into the architectural context of a city and could be used over large buildings or open areas like parking sites. It could provide protection from the sun and at the same time utilize solar radiation to produce heat and electricity.