

India Concentrated Photovoltaic Market, By Product (Reflectors, Refractors), By Concentration (High Concentration Photovoltaic, Low Concentration Photovoltaic), By End Use (Commercial, Utilities, Others), By Region, Competition, Forecast & Opportunities, 2021-2031F

Market Report | 2025-06-06 | 82 pages | TechSci Research

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Report description:

Market Overview

India's Concentrated Photovoltaic (CPV) Market was valued at USD 302 million in 2025 and is projected to reach USD 436 million by 2031, growing at a CAGR of 6.19% during the forecast period. CPV technology utilizes mirrors or lenses to focus sunlight onto high-efficiency solar cells, maximizing energy output with reduced photovoltaic material usage. Unlike traditional flat-panel systems, CPV relies on direct sunlight and employs multi-junction solar cells for improved spectrum capture. With dual-axis tracking systems ensuring optimal sun alignment, CPV systems are particularly effective in sunny regions like western and southern India. This technology is gaining traction for large-scale renewable energy projects, offering an efficient alternative where land and energy output optimization are critical. As India accelerates its shift to clean energy, CPV offers a compelling solution by combining optical concentration and advanced solar technologies to deliver higher performance and land efficiency.

Key Market Drivers

Abundant Solar Resource Availability in India

India's high solar irradiance-averaging 5 to 7 kWh/m²/day, particularly in regions like Rajasthan, Gujarat, and Tamil Nadu-makes it highly favorable for concentrated photovoltaic deployment. CPV systems rely on strong direct normal irradiance (DNI) to focus sunlight through optical components onto compact, high-efficiency cells. This regional solar abundance enhances the viability and output of CPV installations, offering significant advantages over conventional PV in terms of power density.

With limited and often costly land availability, CPV's high energy yield per unit area offers an efficient solution for solar project developers. This is especially relevant as India pushes to expand its renewable energy capacity. The geographic advantage, paired with supportive national energy goals, positions CPV as a valuable tool for maximizing electricity generation while

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conserving space and reducing overall capital deployment.

Key Market Challenges

High Initial Capital Costs and Financial Barriers

A key obstacle for the Indian CPV market is the high upfront cost associated with its advanced technology. CPV systems require specialized components such as multi-junction cells, precision lenses or mirrors, and dual-axis trackers, all of which increase the cost compared to traditional PV systems. The complexity and expense of manufacturing and installation make it harder for developers to achieve cost parity without incentives.

Additionally, many financial institutions in India remain cautious toward funding CPV projects due to limited market familiarity and perceived risk. With a preference for established photovoltaic technologies, banks may impose stricter terms or avoid financing altogether. This limited access to affordable funding slows down CPV adoption, particularly among smaller or mid-sized players in a price-sensitive market like India.

Key Market Trends

Increasing Adoption of Multi-Junction Solar Cells for Enhanced Efficiency

The India CPV market is increasingly embracing multi-junction solar cells to improve energy generation efficiency. These cells, designed with stacked layers to absorb different portions of the solar spectrum, often surpass 30% efficiency-far higher than standard silicon cells.

Given India's limited land resources and high solar irradiance in key regions, multi-junction cells allow more power generation within smaller footprints. Their superior performance under direct sunlight conditions makes them ideal for utility-scale solar plants in high-irradiance areas like Rajasthan and Gujarat. These efficiency gains, coupled with advancements in cell technology, are attracting investment and R&D efforts, supporting CPV's growing role in India's solar energy landscape.

Key Market Players

- Tata Power Solar Systems Limited
- Adani Solar Energy Limited
- Reliance Solar Energy Private Limited
- Vikram Solar Limited
- Waaree Energies Ltd
- RenewSys India Pvt. Ltd.
- Hero Future Energies Pvt. Ltd.
- Azure Power India Pvt. Ltd.

Report Scope:

In this report, the India Concentrated Photovoltaic Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

- India Concentrated Photovoltaic Market, By Product:
 - o Reflectors
 - o Refractors
- India Concentrated Photovoltaic Market, By Concentration:
 - o High Concentration Photovoltaic
 - o Low Concentration Photovoltaic
- India Concentrated Photovoltaic Market, By End Use:
 - o Commercial
 - o Utilities
 - o Others
- India Concentrated Photovoltaic Market, By Region:
 - o South India
 - o North India
 - o West India
 - o East India

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Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the India Concentrated Photovoltaic Market.

Available Customizations:

India Concentrated Photovoltaic Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

- Detailed analysis and profiling of additional market players (up to five).

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