

Concentrated Solar Power Market Forecasts to 2034 – Global Analysis By Storage Type (With Thermal Energy Storage (TES) and Without Thermal Energy Storage), Capacity Range, Technology, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Concentrated Solar Power Market is accounted for \$6.8 billion in 2026 and is expected to reach \$14.0 billion by 2034 growing at a CAGR of 9.5% during the forecast period. Concentrated Solar Power (CSP) is a clean energy method that harnesses sunlight by using reflective surfaces to concentrate solar radiation onto a focal point, producing heat that drives steam turbines for electricity generation. Unlike solar panels, CSP systems can store heat energy, enabling electricity production during non-sunny periods. This storage advantage improves consistency in energy supply. CSP installations are mainly found in areas with strong sunlight, particularly arid regions. Increasing interest in sustainable energy and innovations in thermal storage technologies are boosting CSP adoption as an effective option for utility-scale electricity generation and reliable long-duration energy storage globally.

According to the U.S. Department of Energy (DOE), the United States has 1.7 GW of CSP installed capacity, primarily in California and Nevada, including the 392 MW Ivanpah Solar Electric Generating System.

Market Dynamics:

Driver:

Increasing demand for clean and renewable energy

Growing global interest in clean and renewable energy sources is significantly driving the Concentrated Solar Power (CSP) market. Governments and industries are shifting away from fossil fuels to lower carbon emissions and address climate concerns. CSP provides an environmentally friendly method of electricity generation, producing power without releasing harmful gases. Its compatibility with conventional energy infrastructure supports wider implementation. As nations pursue aggressive sustainability goals and prioritize energy transition plans, CSP adoption is increasing steadily. This trend is especially strong in regions with abundant sunlight, rising power needs, and heightened focus on environmental protection and sustainable development initiatives.

Restraint:

High initial capital investment

One of the main challenges hindering the growth of the Concentrated Solar Power (CSP) market is the substantial upfront investment required. Establishing CSP facilities demands high expenditure on components such as reflective mirrors, receivers, energy storage systems, and land development. The technology involves complex design and large-scale infrastructure, making it more expensive than alternatives like solar photovoltaic systems. Securing funding for such projects can be difficult, particularly in emerging economies. Additionally, the extended return on investment period reduces attractiveness for stakeholders. These financial barriers limit broader deployment and slow the expansion of CSP technology in the global energy sector.

Opportunity:

Integration with energy storage systems

The adoption of advanced energy storage technologies creates significant growth potential for the Concentrated Solar Power (CSP) market. CSP systems have the unique ability to store heat energy and generate electricity even when sunlight is unavailable. This feature improves power grid stability and ensures a consistent energy supply. Increasing investments in solutions like molten salt storage enhance the efficiency and viability of CSP plants. As the demand for long-duration energy storage rises worldwide, CSP becomes an attractive option for managing energy fluctuations and supporting renewable integration, positioning it as a key technology in the future energy landscape.

Threat:

Declining costs of solar photovoltaic (PV) technology

Falling prices of solar photovoltaic (PV) systems represent a major challenge for the Concentrated Solar Power (CSP) market. Continuous innovation, mass production, and strong supply networks have significantly reduced PV costs, making it a more economical option. Investors and energy providers often favor PV due to its affordability and ease of installation. Compared to CSP, PV projects require less time and complexity to deploy. As the energy industry increasingly focuses on cost-effective solutions, CSP finds it difficult to match PV's pricing advantage. This trend restricts funding and slows down the overall expansion of CSP technologies worldwide.

Covid-19 Impact:

The outbreak of COVID-19 had both negative and positive effects on the Concentrated Solar Power (CSP) market. In the early stages, strict lockdowns disrupted supply chains, delayed construction timelines, and limited labor availability, slowing project progress. Financial instability also led to postponement of several planned installations. Despite these challenges, the pandemic highlighted the need for reliable and sustainable energy sources. Many governments incorporated renewable energy into their recovery strategies, boosting interest in CSP technology. As restrictions eased and economies reopened, the market began to stabilize, driven by supportive policies and an increasing emphasis on clean and resilient energy systems.

The parabolic trough segment is expected to be the largest during the forecast period

The parabolic trough segment is expected to account for the largest market share during the forecast period owing to their advanced stage of development and broad commercial use. These systems utilize curved reflective mirrors to concentrate solar energy onto a central tube, producing heat that is converted into electricity. Their strong market position is supported by dependable performance, operational stability, and lower risk compared to alternative CSP technologies. The ability to integrate thermal storage solutions enhances their efficiency and ensures steady power output. With well-established infrastructure, extensive operational experience, and continuous advancements, parabolic trough technology remains the leading and most commonly adopted CSP solution worldwide.

The industrial segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the industrial segment is predicted to witness the highest growth rate, driven by rising demand for clean and efficient heat generation in various industries. Applications in manufacturing, mining, chemical processing, and food production require steady thermal energy, which CSP systems can deliver effectively. Increasing focus on lowering emissions and adopting environmentally friendly operations is encouraging industries to shift toward solar-based thermal solutions. CSP provides a sustainable substitute for conventional fuels, enhancing operational efficiency. Additionally, supportive government policies and escalating energy prices are motivating industrial sectors to invest in CSP technologies for long-term benefits.

Region with largest share:

During the forecast period, the Europe region is expected to hold the largest market share, supported by its proactive approach toward renewable energy adoption and strong governmental backing. The region benefits from supportive policies, financial incentives, and ambitious climate goals that promote the use of CSP technology. Continuous investments in innovation, along with the development of large-scale solar projects, contribute to its leading position. Well-developed infrastructure and the presence of skilled industry participants further enhance growth. Moreover, the region's commitment to reducing reliance on conventional fuels and ensuring energy security is driving increased adoption of CSP, establishing Europe as a key market globally.

Region with highest CAGR:

Over the forecast period, the Rest of the World (RoW) region is anticipated to exhibit the highest CAGR, supported by strong solar potential and growing investment in clean energy projects. Governments are actively working to diversify energy sources and decrease reliance on traditional fuels. Favourable policies, large-scale project developments, and long-term energy strategies are encouraging CSP adoption. The region's extensive desert landscapes and high solar irradiance provide ideal conditions for this technology. Increasing electricity demand and a strong focus on sustainable development are further contributing to the rapid expansion of the CSP market in this region.

Key players in the market

Some of the key players in Concentrated Solar Power Market include Abengoa Solar Inc, BrightSource Energy, Inc., ACWA Power, TSK Flagsol Engineering GmbH, Aalborg

CSP A/S, SolarReserve, LLC, Acciona Energia, S.A., eSolar, Inc., Atlantica Sustainable Infrastructure plc, Enel Green Power, ENGIE SA, Siemens Energy AG, Torresol Energy, Solarlite CSP Technology GmbH, Chiyoda Corporation, Shouhang High-Tech Energy., Ltd, Northwest Electric Power Design Institute Inc and GE Renewable Energy.

Key Developments:

In November 2025, Siemens Energy has signed a contract to design and deliver the power conversion system for Oklo's Aurora powerhouse reactors. The contract will see Siemens Energy conduct detailed engineering and layout activities for a condensing SST-600 steam turbine, an SGen-100A industrial generator, and associated auxiliaries to support Oklo's first advanced reactor, the Aurora powerhouse at Idaho National Laboratory.

In October 2025, Enel and Masdar complete the partnership agreement signed in March 2025 for 446 mw of photovoltaic plants operating in Spain. This transaction, which follows the partnership with Masdar finalized relating to a 2 GW portfolio of other solar assets already operating in Spain, is in line with the "Partnership" business model outlined by Enel in its 2025-2027 Strategic Plan with the aim to retain control of strategic assets while maximizing productivity and returns on invested capital.

In August 2025, Engie SA has recently signed its first 100% virtual storage agreement in the Australian market, a five-year, derivatives-only deals with Australia's AGL Energy Limited. The contract represents a financial structure that replicates how a battery works on the market. The agreement enables the French company to offer firming capacity to its customers without relying on physical storage assets.

Storage Types Covered:

With Thermal Energy Storage (TES)

Without Thermal Energy Storage

Capacity Ranges Covered:

Below 50 MW

50-150 MW

Above 150 MW

Technologies Covered:

Parabolic Trough

Solar Tower

Linear Fresnel Reflector

Dish Stirling

Applications Covered:

Electricity Generation

Process Heat Supply

Hybrid Renewable Integration

End Users Covered:

Utilities

Industrial

Commercial

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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