

Space Solar Cells Market Trends and Analysis by Application, Vertical, Region, and Segment Forecast to 2029

The Business Research Company's Space Solar Cells Market Trends and Analysis by Application, Vertical, Region, and Segment Forecast to 2029

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What Is The Estimated Industry Size Of Space Solar Cells Market?

In recent times, the market size for space solar cells has witnessed considerable expansion. Its value is projected to surge from \$1.23 billion in 2024 to \$1.38 billion in 2025, with a compound annual growth rate (CAGR) of 12.4%. The prominent growth observed during the historic period is a result of factors such as heightened investments in space exploration endeavors, a surge in funds dedicated by governments for spacecraft missions, amplified demand for dependable power supplies in space projects, a mounting focus on sustainable and ecological energy solutions, and an increase in worldwide satellite

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It will grow to \$2.18 billion in 2029 at a compound annual growth rate (CAGR) of 12.0%.”

*The Business Research
Company*

launches.

Expectations are high for the expansion of the space solar cells market in the coming years, with projections estimating a rise to \$2.18 billion by 2029. This growth, representing a compound annual growth rate (CAGR) of 12.0%, is mainly due to an increase in space exploration activities, involvement of various nations and private entities in space exploration, growing requirements for larger, more efficient solar arrays in future space missions, an upward demand for renewable energy sources for space applications, and a rise in partnerships between space agencies and private companies. Key trends during the anticipated period include the progression of photovoltaic technologies, collaborations between satellite producers and solar cell suppliers,

investing in the research and development of lighter solar cells, incorporation of high-efficiency materials into solar panels, and advancements in energy storage technology for space applications.

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What Are The Major Factors Driving The Space Solar Cells Global Market Growth?

The growth of the space solar cells market is set to be fueled by the rising number of satellite launches. Satellite launches entails sending out artificial satellites into space utilizing launch vehicles or rockets. The surge in demand for such launches stems from an increasing necessity for connectivity, as many regions are seeking dependable internet access via satellite-enabled broadband services. Space solar cells play a crucial role in these launches by supplying reliable and constant power in the severe space environment, facilitating missions of extended duration. They improve the functionality of satellites by powering the onboard systems, communication devices, and equipment, thereby enhancing the efficiency and reliability of the mission. As an illustration, the US-based Government Accountability Office revealed in September 2022 that nearly 5,500 satellites were active in orbit, with expectations of the launch of an extra 58,000 by the year 2030. Consequently, this uptrend in satellite launches is bolstering the growth of the space solar cells market.

Who Are The Leading Companies In The Space Solar Cells Market?

Major players in the Space Solar Cells Global Market Report 2025 include:

- The Boeing Company
- Airbus Group
- Northrop Grumman Corporation
- Mitsubishi Electric Corporation
- Thales Group
- Bharat Electronics Ltd.
- Hanergy Thin Film Power Group Ltd.
- Redwire Corporation
- 5N Plus Inc.
- Aetherflux Inc.

What Are The Key Trends And Market Opportunities In The Space Solar Cells Sector?

Prominent enterprises in the space solar cell market are intent on developing novel products, such as CubeSats for in-orbit testing. This aims to provide dependable validation of solar cell technologies, improve efficiency, and broaden their reach in the increasing space solar power segment. CubeSats are compact, modular spacecraft purposed to carry test photovoltaic (PV) cells, extendable solar arrays, and wireless power systems to orbit. This offers an effective and economical method to appraise solar technologies in actual space conditions. For instance, in January 2023, the California Institute of Technology (Caltech), a US-based tech development firm for harnessing solar power in space, initiated the launch of a 50-kg Space Solar Power

Demonstrator (SSPD) on a Momentus Vigoride spacecraft via a SpaceX Transporter-6 mission. The SSPD examined deployable structures (DOLCE), 32 kind of photovoltaic cells (ALBA), and a pliable microwave power array (MAPLE) for wireless power transfer in orbit. These demonstrations support companies and research institutes to validate efficiency, resilience, deployment mechanics, and power transmission, making CubeSats a vital instrument for progressing space solar cell technologies and facilitating scalable deployment in future space missions.

What Are The Primary Segments Covered In The Global Space Solar Cells Market Report?
The space solar cells market covered in this report is segmented

- 1) By Type: Monocrystalline Solar Cells, Polycrystalline Solar Cells, Thin-Film Solar Cells, Multi-Junction Solar Cells, Concentrated Photovoltaic Cells (CPV)
- 2) By Technology: Silicon-Based Technology, Gallium Arsenide Technology, Organic Photovoltaic Technology, Perovskite Solar Cells
- 3) By Functionality: Power Generation, Power Storage Integration, Energy Efficiency Solutions, Thermal Management Systems
- 4) By Application: Satellite Power Systems, Spacecraft Power Systems, Space Stations, Robotic Missions, Planetary Exploration
- 5) By End-User: Government And Defense Agencies, Aerospace Manufacturers, Research Institutions, Private Space Exploration Companies

Subsegments:

- 1) By Monocrystalline Solar Cells: High Efficiency, Standard Efficiency, Flexible
- 2) By Polycrystalline Solar Cells: High Efficiency, Standard Efficiency, Bifacial
- 3) By Thin-Film Solar Cells: Cadmium Telluride, Copper Indium Gallium Selenide, Amorphous Silicon
- 4) By Multi-Junction Solar Cells: Two Layer, Three Layer, Four Layer
- 5) By Concentrated Photovoltaic Cells: Fresnel Lens, Parabolic Reflector, Micro Concentrator

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Which Region Is Forecasted To Grow The Fastest In The Space Solar Cells Industry?

The leading region in the Space Solar Cells Global Market Report 2025 was North America in 2024, with expectations of Asia-Pacific becoming the region with the swiftest growth rate. The report encompasses regions including Asia-Pacific, Western Europe, Eastern Europe, North America, South America, the Middle East, and Africa.

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