

Moon-Based Solar Power Array Market: Future Demand and Top Key Players Analysis | 2029

The Business Research Company's Moon-Based Solar Power Array Global Market Report 2025 - Market Size, Trends, And Global Forecast 2025-2034

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What Is The Expected Cagr For The Moon-Based Solar Power Array Market Through 2025?

In recent years, [the market size of the moon-based solar power array](#) has seen significant

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growth. It's projected to increase from \$1.04 billion in 2024 to \$1.27 billion in 2025, with a compound annual growth rate (CAGR) of 21.5%. The phenomenal growth during the historic period can be attributed to several factors such as heightened focus on moon-situated disaster recovery energy systems, an escalating desire for energy self-reliance away from earth-bound resources, increasing research in lunar polar regions to maximize solar coverage, a surge in exploration of solutions for lunar night energy continuation, and expanding initiatives for the diversification of space industry through moon-based energy ventures.

[The market for solar power arrays located on the moon](#) is slated for substantial increases in the coming years, ballooning to \$2.73 billion by 2029 with a yearly growth rate on average of 21.1%. The growth during the projection period can be linked to a surge in funds allocated to renewable energy projects in space, increased government support for moon exploration initiatives, a growing need for sustainable energy for space expeditions, enhanced international cooperation for lunar infrastructure and continuous progress in wireless power transmission technologies. Significant trends for the projection period consist of progress in wireless power transmission systems, enhancements in the efficiency of advanced photovoltaic cells, revolutionary ideas for

lunar dust mitigation, the application of artificial intelligence for energy maximization and advancements in the design of modular solar arrays.

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What Are The Key Factors Driving Growth In The Moon-Based Solar Power Array Market?

[The growth of the lunar solar power array market](#) is being fueled by escalating investments in space technology. The term 'investments in space technology' refers to the financial contribution made by governments, organizations, or private sector entities to facilitate the development, improvement, and deployment of innovations that aid space exploration, structure, and commercialization. Because of the rising demand for services based on satellites that provide vital advantages in communication, navigation, and observation of the Earth, the investments in space technology are growing. These investments facilitate the increased use of lunar solar power arrays by promoting the improvement of infrastructure, materials, and energy systems crucial for scalable and sustainable applications outside Earth. For example, a U.S. government agency, NASA, according to its Fiscal Year (FY) 2023 Budget Request published in March 2022, the budget allocated for Space Technology was \$1.438 billion. This shows a 30.7% hike compared to the FY 2022 approved budget and a 0.9% rise over the FY 2022 President's request. As such, the rise in investment in space technology is amplifying the growth of the lunar solar power array market.

What Are The Top Players Operating In The Moon-Based Solar Power Array Market?

Major players in the Moon-Based Solar Power Array Global Market Report 2025 include:

- The Boeing Company
- Airbus SE
- Lockheed Martin Corporation
- Northrop Grumman
- Mitsubishi Electric
- National Aeronautics and Space Administration (NASA)
- Thales Group
- L3Harris Technologies
- Shimizu Corporation
- Blue Origin

What Are The Upcoming Trends Of Moon-Based Solar Power Array Market In The Globe?

Leading enterprises in the moon-based solar power array market are prioritizing technological advancements such as vertical solar array systems to enhance energy yield in conditions of low sunlight and assure steady electricity provision at the lunar poles. Vertical solar array systems are solar panel constructions designed to stand erect on the lunar surface, thereby enabling them to harness sunlight even at low angles. For instance, Astrobotic Technology, an American space robotics firm, unveiled LunaGrid in September 2022, which is a commercial power generation and distribution service designed for the lunar poles. This system incorporates

Vertical Solar Array Technology (VSAT), wireless chargers, and tethered CubeRovers to provide a dependable source of solar power to landers, rovers, habitats, and science systems on the Moon. It hopes to enable survival during lunar nights and facilitate operations spanning multiple years. This initiative presents a scalable method for establishing a sustainable off-planet energy infrastructure in the moon-based solar power array market.

Comprehensive Segment-Wise Insights Into The Moon-Based Solar Power Array Market

The moon-based solar power array market covered in this report is segmented as

- 1) By Component: Solar Panels, Power Transmission Systems, Energy Storage, Control Systems, Other Components
- 2) By Technology: Photovoltaic, Concentrated Solar Power, Hybrid Systems
- 3) By Deployment Type: Permanent, Temporary
- 4) By Application: Energy Generation, Space Missions, Lunar Habitats, Satellite Power, Other Applications
- 5) By End-User: Government And Space Agencies, Commercial Enterprises, Research Institutes, Other End-Users

Subsegments:

- 1) By Solar Panels: Monocrystalline Solar Panels, Polycrystalline Solar Panels, Thin Film Solar Panels
- 2) By Power Transmission Systems: Wireless Power Transmission, Laser Power Transmission, Microwave Power Transmission
- 3) By Energy Storage: Thermal Energy Storage, Chemical Energy Storage, Mechanical Energy Storage
- 4) By Control Systems: Autonomous Control Systems, Remote Monitoring Systems, Fault Detection Systems
- 5) By Other Components: Energy Generation, Space Missions, Lunar Habitats, Satellite Power

View the full moon-based solar power array market report:

<https://www.thebusinessresearchcompany.com/report/moon-based-solar-power-array-global-market-report>

Global Moon-Based Solar Power Array Market - Regional Insights

In 2024, North America led the global market for moon-based solar power arrays. The region predicted to experience the most rapid growth in the upcoming period is Asia-Pacific. The report on this market includes data from the following regions: Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East, and Africa.

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