

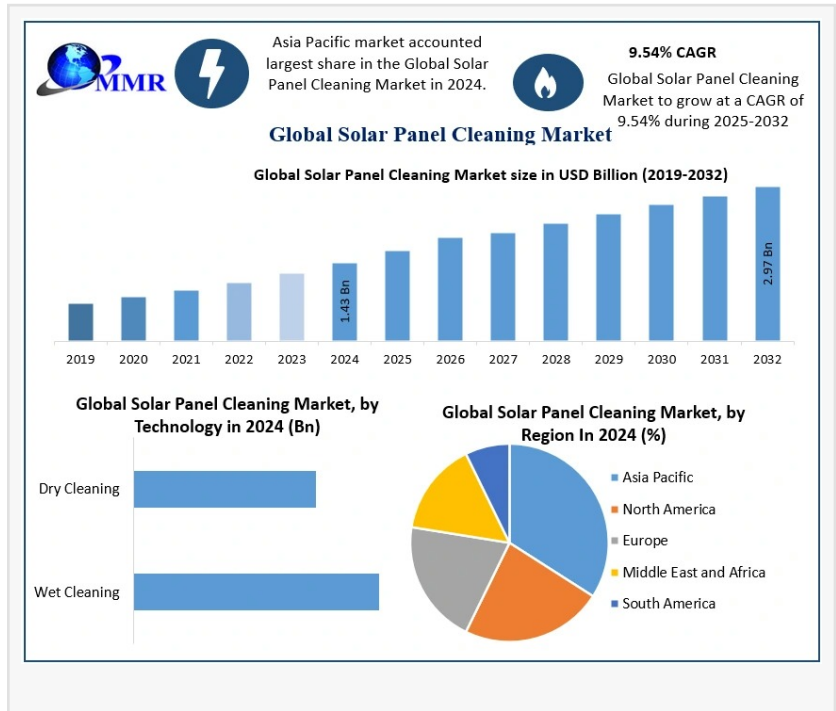
Solar Panel Cleaning Market Growing at 9.54% CAGR to Reach USD 2.97 Billion by 2032

Maximize Market Research

The Asia Pacific region is projected to be leading region in the solar panel cleaning market growth.

WILMINGTON, DE, UNITED STATES,
September 11, 2025 /
EINPresswire.com/ -- Solar Panel
Cleaning Industry Overview

The [Solar Panel Cleaning Market](#) size was valued at USD 1.43 billion in 2024, and the Solar Panel Cleaning Market revenue is expected to grow at 9.54% through 2025 to 2032, reaching nearly USD 2.97 billion.



Solar panel cleaning is essential to maintain energy efficiency, as dust, bird droppings, and salt buildup can significantly reduce output. Demand is rising globally due to the expansion of solar installations, particularly in the utility-scale and commercial sectors. Robotiv cleaning remains the most common method,

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Innovative cleaning solutions ensure every ray of sunlight is converted into clean, renewable energy”

Dharti Raut

though automated and water-efficient solutions are increasingly preferred for large projects. Prices vary by region and scale, with residential systems costing more per panel than large solar farms. Asia-Pacific’s strong investment in solar energy and growing installed capacity are driving demand for cleaning services. Coastal environments and dry seasons increase the need for regular maintenance, making efficient cleaning solutions a

growing priority

The comprehensive study provides an in-depth analysis of the Solar Panel Cleaning Market, offering crucial insights into its current landscape and future trajectory.

Key Insights & Recent Developments

The study highlights the growing adoption of automated and robotic cleaning systems due to rising efficiency demands, water scarcity, and advancements in AI and IoT technologies. Utility-scale solar farms are driving demand, with soiling losses reducing panel output by up to 25%. Automated solutions, though initially costly, are increasingly preferred over manual methods for their long-term ROI and sustainability.

Global Solar Panel Cleaning Market Segments Covered	
By Type	Water Based Cleaning System Electrostatic Robotic
By Process	Semi-Automated Automated Water Brushes Electrostatic Automated Robotic Others
By Mode of Operation	Manual Autonomous
By Region	North America (United States, Canada and Mexico) Europe (UK, France, Germany, Italy, Spain, Sweden, Austria, Turkey, Russia and Rest of Europe) Asia Pacific (China, India, Japan, South Korea, Australia, ASEAN (Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam etc.) and Rest APAC) Middle East and Africa (South Africa, GCC, Egypt, Nigeria and Rest of ME&A) South America (Brazil, Argentina, Colombia and Rest of South America)

A recent development in the Solar Panel Cleaning Market, such as the deployment of drones and robotic cleaners by Indian innovators (e.g., PDKV and Taypro), is significantly impacting market dynamics. These solutions offer fast, localized, and water-efficient alternatives, particularly vital in arid and polluted regions where water usage is heavily constrained.

The Solar Panel Cleaning Market is seeing a major shift towards eco-friendly, waterless, and smart cleaning technologies, with increased R&D in self-cleaning coatings, predictive maintenance, and service-based business models that align with performance-based solar contracts.

For more information, visit our website: <https://www.maximizemarketresearch.com/request-sample/39243/>

Solar Panel Cleaning Market Dynamics

The solar panel cleaning market is rapidly evolving, driven by rising solar capacity, efficiency losses from soiling (up to 25%), and water scarcity. Automation is gaining ground, with robotic and drone-based cleaning systems being adopted across utility-scale projects. Recent innovations include India’s PDKV drone that cleans 1 MW in 30 minutes, and Israel-based Airtouch Solar’s waterless robots deployed by Adani and ReNew. Companies like Sleepwalkers (India) and Sol Clarity (USA) are also developing dry and electromagnetic cleaning solutions. Key players include Ecoppia (water-free robotic cleaning), Karcher (industrial systems), and SunBrush mobil. Service-based models and predictive maintenance using IoT are reshaping O&M strategies. High upfront costs, lack of standards, and logistical challenges remain barriers. The market is shifting toward eco-friendly, water-efficient, and AI-driven solutions, with long-term contracts reflecting growing confidence in automated technologies. These trends position the sector for sustainable, high-growth expansion in arid and polluted regions.

Solar Panel Cleaning Market Regional Analysis

The report provides a detailed breakdown of the market across major regions:

Asia-Pacific: Asia-Pacific dominates the solar panel cleaning market due to massive solar deployments in China and India, high soiling from dust and pollution, and strong government support. Key players include Taypro, Sleepwalkers, Airtouch Solar, Ecoppia, and Sunpure, offering advanced robotic and waterless cleaning solutions across large-scale installations.

Middle East & Africa (MEA): The Middle East & Africa (MEA) is the second-largest solar panel cleaning market due to extreme dust, water scarcity, and large-scale solar farms. Key players like Ecoppia, Airtouch Solar, SolarCleano, and Kärcher lead with waterless robotic and automated cleaning solutions, supported by strong government policies and sustainability goals.

Solar Panel Cleaning Market Segments Covered

The study segments the market based on Type, Process, and Mode of Operation

By Type Robotic cleaning systems dominate due to high efficiency, water conservation, and suitability for large, rough terrains. They improve panel output by reducing soiling. MEA leads adoption due to desert conditions and water scarcity, while APAC (India, China) grows rapidly with rising solar capacity.

By Process Automated cleaning dominates by reducing labor, minimizing errors, and lowering operational costs. It uses IoT and AI for predictive maintenance, optimizing cleaning schedules and improving panel performance. APAC leads due to large solar capacity, while MEA adopts it to save water and labor.

By Mode of Operation Autonomous cleaners operate without human control, ideal for remote or large solar farms. They reduce downtime, lower risks, and enable 24/7 cleaning, boosting energy yield. MEA leads adoption due to harsh environments, with North America and APAC also growing rapidly.

Solar Panel Cleaning Market Trends

The solar panel cleaning market is driven by robotic, automated, and autonomous technologies, with key players like Ecoppia, Greenleap Robotics, Infosys, and Sol-Bright leading innovation. Ecoppia has deployed over 4,000 MW globally, while Greenleap has cleaned 6 million panels across 400 MWp. The Asia-Pacific (APAC) and Middle East & Africa (MEA) regions dominate due to large-scale solar farms and harsh environmental conditions. Recent developments include an Indian drone that cleans 1 MW solar plants in 30 minutes, highlighting rapid advances in eco-friendly and efficient cleaning solutions.

Competitive Landscape

The solar panel cleaning market is advancing with key players launching innovative solutions. BP Metalmecanica s.r.l. offers the Solar Cleaner C4000 Telescopic with a long telescopic arm for versatile water and dry cleaning, and the F3500 PM model for large installations. Solar Cleaning Machinery (SCM) provides hydraulic and extendable pole brushes like the P1 and D2 Models, adaptable to tractors and excavators. Indisolar Products Pvt. Ltd. develops fully autonomous, SCADA-enabled, waterless robotic cleaners powered by solar energy and smart sensors. AX System focuses on innovative solar cleaning with its AX SOLAR ROBOT® brand. VIP Clean s.r.l. delivers eco-friendly cleaning via its OUT COMPACT PRO PV system, producing pure water through reverse osmosis for residue-free cleaning.

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The report profiles key players in the market, including

The Maximize Market Research report profiles key players in the Solar Panel Cleaning Market

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Solar Cleaning Machinery (SCM)
Indisolar Products Private Limited
AX System
VIP Clean s.r.l.
IDRIS Automation
Unger Germany GmbH
Enel Green Power S.p.A.
Heliotex LLC
Ecoppia
Ecovacs Robotics
Parish Maintenance Supply
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