

# Global Photovoltaic Panel Cleaning Intelligent Robot Market Growth 2026-2032

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## Abstracts

The global Photovoltaic Panel Cleaning Intelligent Robot market size is predicted to grow from US\$ 172 million in 2025 to US\$ 437 million in 2032; it is expected to grow at a CAGR of 14.5% from 2026 to 2032.

The intelligent photovoltaic panel cleaning robot is a photovoltaic operation and maintenance equipment integrating sensors, control algorithms, and automated actuators. It is used to automatically identify and clean contaminants such as dust, sand, and bird droppings from the surface of photovoltaic modules, and autonomously plan its work path and cleaning strategy according to environmental conditions. These robots typically possess positioning and navigation, remote monitoring, and data feedback capabilities, enabling continuous and highly consistent cleaning operations without shutdown. This significantly reduces manual operation and maintenance costs and improves the overall power generation efficiency of the power plant, making it crucial equipment for achieving intelligent and refined operation and maintenance of large-scale photovoltaic power plants. Sales in 2025 were 36,000 units, with an average price of US\$4,900, total production capacity of 40,000 units, and a gross profit margin of 41%.

From the demand and value perspective, the core market driver for intelligent photovoltaic panel cleaning robots is shifting from 'saving labor' to 'ensuring power generation revenue and asset return.' In large-scale ground-mounted power plants, the impact of module contamination on average annual power generation has been incorporated into the power plant revenue calculation model, and the frequency and timing of cleaning directly affect IRR and levelized cost of electricity (LCOE). Intelligent robots, through on-demand cleaning, differentiated scheduling, and stable operation, can avoid the coexistence of over-cleaning and under-cleaning, linking maintenance

behavior to actual power generation losses, and gradually transforming from maintenance tools into an important component of power plant revenue management.

From the supply and industry evolution perspective, the intelligent photovoltaic panel cleaning robot market is transitioning from 'single-unit equipment competition' to 'system-level solution competition.' Leading manufacturers are integrating robots with power plant monitoring systems, meteorological data, and power generation analysis platforms to create scalable and replicable intelligent operation and maintenance solutions. Simultaneously, they are lowering the initial investment threshold for power plant owners through equipment leasing, service outsourcing, or 'pay-per-cleaning' models. As industry standards and the level of digitalization in operation and maintenance increase, manufacturers with algorithmic capabilities, system integration capabilities, and long-term service capabilities will occupy a more advantageous position during market consolidation.

LP Information, Inc. (LPI) ' newest research report, the “Photovoltaic Panel Cleaning Intelligent Robot Industry Forecast” looks at past sales and reviews total world Photovoltaic Panel Cleaning Intelligent Robot sales in 2025, providing a comprehensive analysis by region and market sector of projected Photovoltaic Panel Cleaning Intelligent Robot sales for 2026 through 2032. With Photovoltaic Panel Cleaning Intelligent Robot sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US\$ millions of the world Photovoltaic Panel Cleaning Intelligent Robot industry.

This Insight Report provides a comprehensive analysis of the global Photovoltaic Panel Cleaning Intelligent Robot landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyzes the strategies of leading global companies with a focus on Photovoltaic Panel Cleaning Intelligent Robot portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms' unique position in an accelerating global Photovoltaic Panel Cleaning Intelligent Robot market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Photovoltaic Panel Cleaning Intelligent Robot and breaks down the forecast by Type, by Application, geography, and market size to highlight emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Photovoltaic Panel

Cleaning Intelligent Robot.

This report presents a comprehensive overview, market shares, and growth opportunities of Photovoltaic Panel Cleaning Intelligent Robot market by product type, application, key manufacturers and key regions and countries.

Segmentation by Type:

Fixed

Mobile

Segmentation by Clean Form:

Dry Brush PV Cleaning Robot

Water-based PV Cleaning Robot

Segmentation by Automation:

Fully Automatic PV Cleaning Robot

Semi-automatic PV Cleaning Robot

Segmentation by Application:

Distributed Photovoltaic Power Station

Centralized Photovoltaic Power Station

This report also splits the market by region:

Americas

United States

Canada

Mexico

Brazil

## APAC

China

Japan

Korea

Southeast Asia

India

Australia

## Europe

Germany

France

UK

Italy

Russia

## Middle East & Africa

Egypt

South Africa

Israel

Turkey

GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analysing the company's coverage, product portfolio, its market penetration.

SunPower

Innovpower

BOSON

Westrong

SUNPURE

Alion Energy

Ecoppia

SolarCleano

SERBOT AG

Airtouch Solar

HyCLEANER

Tetraelc

Solenergy

Cooperwind

Iouluo

Washpanel

Clean Solar Solutions Ltd

Derui Intelligent

Ecobright

Xiamen Lanxu Intelligent Technology

Lingdu (Guangdong) Intelligent

Xingluo Smart Technology(Suzhou) Co., Ltd.

#### Key Questions Addressed in this Report

What is the 10-year outlook for the global Photovoltaic Panel Cleaning Intelligent Robot market?

What factors are driving Photovoltaic Panel Cleaning Intelligent Robot market growth, globally and by region?

Which technologies are poised for the fastest growth by market and region?

How do Photovoltaic Panel Cleaning Intelligent Robot market opportunities vary by end market size?

How does Photovoltaic Panel Cleaning Intelligent Robot break out by Type, by Application?

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