

Photovoltaic Noise Barrier Market - Global Industry Size, Share, Trends, Opportunity and Forecast, Segmented By Application (Motorways, Roadways), By Installation (Cassettes, Shingles, Zigzag), By PV Module (Conventional, Bifacial), By Region & Competition, 2021-2031F

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Abstracts

The Global Photovoltaic Noise Barrier Market is projected to expand from USD 2.53 Billion in 2025 to USD 4.33 Billion by 2031, reflecting a compound annual growth rate of 9.37%. These barriers act as dual-purpose infrastructure, merging solar power generation with acoustic walls to reduce traffic noise while creating renewable energy. The sector is largely driven by rapid urbanization and the urgent need for efficient land use, as these systems generate power within existing transport corridors without consuming extra land. Additionally, strict noise control regulations and the push for decarbonized transport infrastructure serve as key accelerators for adopting these multifunctional technologies.

Despite this potential, the market faces hurdles related to substantial upfront costs and the technical difficulties inherent in retrofitting older infrastructure with electrical components. However, the broader solar industry offers a strong foundation for growth. According to the International Energy Agency Photovoltaic Power Systems Programme (IEA PVPS), in 2024, the cumulative global installed capacity of photovoltaics surpassed 1.6 terawatts, establishing a robust industrial base and supply chain. This scale is crucial for lowering production costs and facilitating the deployment of specialized applications such as photovoltaic noise barriers.

Market Driver

Government incentives targeting green infrastructure are significantly transforming the market by utilizing public land for renewable energy generation. Authorities are increasingly issuing tenders that monetize vertical space, effectively eliminating the land-cost issues that previously hindered solar installation along transport routes. These policies foster a secure investment climate, promoting the inclusion of energy-generating noise barriers in national road and rail modernization plans. Highlighting this shift, France's Regional Highways Division (DIR) announced in a strategic tender in April 2024 that there is a potential for 240 MW of solar capacity across its highway networks, indicating a major move toward state-supported dual-use infrastructure.

In parallel, technological progress in bifacial and transparent photovoltaic modules is accelerating adoption by optimizing energy production in limited urban spaces. Modern systems employ high-efficiency integrated modules capable of capturing sunlight from various angles, which increases power density without sacrificing noise reduction capabilities. According to a May 2024 report by Mitrex, their advanced sound-absorptive barriers now reach an installed capacity of 1.2 MW per kilometer, showcasing the efficiency of new materials. This technological evolution creates significant retrofit possibilities, with the Fraunhofer Institute for Solar Energy Systems ISE estimating in 2024 that the technical potential for such barriers in Germany alone stands at 5 GW.

Market Challenge

The significant capital investment required for Photovoltaic Noise Barriers (PVNB), alongside the complex engineering demanded for retrofitting transport networks, creates a major barrier to widespread scalability. Unlike standard ground-mounted solar farms that rely on uniformity, PVNB projects necessitate custom structural reinforcements and specialized module designs to satisfy rigorous safety and acoustic requirements. This technical intricacy elevates the Levelized Cost of Electricity (LCOE), leading developers to perceive these dual-purpose systems as financially riskier than traditional, less expensive noise abatement solutions.

The effect of these elevated initial costs is exacerbated by a more restrictive investment environment for infrastructure-integrated photovoltaics. In established markets where PVNB technology is most viable, financial constraints have notably decelerated deployment for complex systems. For example, according to SolarPower Europe, the solar market in the European Union saw a marked slowdown in 2024, with annual growth falling to just 4% following a previous surge. This stagnation suggests that during periods of capital constraint, capital-intensive niche applications like photovoltaic

noise barriers are subject to greater scrutiny and delayed funding compared to simpler utility-scale projects.

Market Trends

Integrating photovoltaic noise barriers with electric vehicle charging stations is developing into a key strategic trend aimed at electrifying transport networks without increasing grid congestion. By producing electricity directly alongside transport corridors, these systems minimize transmission losses and supply localized power to high-demand fast-charging points. This combination becomes increasingly vital as countries expand charging infrastructure to support growing EV numbers. According to the International Energy Agency's (IEA) 'Global EV Outlook 2025' released in April 2025, the European Union increased its fast-charger network by almost 50% in 2024 to reach 71,000 units, underscoring the rising need for decentralized energy solutions.

Concurrently, the use of colored and aesthetically flexible PV modules is gaining popularity as a means to ensure public acceptance in visually sensitive urban areas. Developers are moving away from purely industrial designs to implement visually integrated and geometrically sophisticated barriers that serve as architectural features while reducing noise. This emphasis on design flexibility is proving economically sound while helping to secure community approval. As noted by PV Magazine in November 2024 regarding a Belgian-Dutch pilot study, a new 'ZigZag' photovoltaic noise barrier design demonstrated a calculated payback period of 6 to 10 years, proving that aesthetic innovation can successfully balance visual appeal with financial viability.

Key Market Players

ABB

Siemens

GE Renewable Energy

Sunseap

BayWa r.e.

SCHOTT Solar

JinkoSolar

Trina Solar

Sharp

Report Scope

In this report, the Global Photovoltaic Noise Barrier Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Photovoltaic Noise Barrier Market, By Application

Motorways

Roadways

Photovoltaic Noise Barrier Market, By Installation

Cassettes

Shingles

Zigzag

Photovoltaic Noise Barrier Market, By PV Module

Conventional

Bifacial

Photovoltaic Noise Barrier Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Photovoltaic Noise Barrier Market.

Available Customizations:

Global Photovoltaic Noise Barrier Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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