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Solar LED Street Lighting Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Application (Commercial Lighting and Others), By Lighting Type (CFL and LED), By Product Type (Stand alone and On grid), By Region & Competition, 2021-2031F

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Abstracts

The Global Solar LED Street Lighting Market is projected to expand significantly, rising from USD 6.52 Billion in 2025 to USD 13.86 Billion by 2031, achieving a CAGR of 13.39%. These systems, which integrate photovoltaic panels, LED luminaires, and rechargeable batteries, function independently of the central utility grid to deliver outdoor illumination. Key factors propelling this growth include the escalating international demand for energy-efficient public infrastructure and government regulations designed to lower carbon emissions in urban settings. Furthermore, the ability of these standalone units to operate effectively in remote areas substantially curtails the immense infrastructure expenses typically linked with extending traditional power grids.

However, a considerable obstacle impeding market expansion is the substantial initial capital investment needed for dependable battery storage and photovoltaic components. This financial barrier frequently discourages adoption among cost-conscious municipalities, even though the technology promises long-term operational cost reductions. Highlighting the persistent interest in autonomous energy solutions, the Global Off-Grid Lighting Association reported in 2024 that the off-grid solar sector achieved sales of 9.3 million units. This figure underscores a sustained demand for independent power sources, which continues to underpin the wider acceptance and implementation of solar lighting technologies.

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Market Driver

The Global Solar LED Street Lighting Market is being fundamentally reshaped by the incorporation of IoT and smart city connectivity, which upgrades standalone units into intelligent data nodes. This convergence of technologies enables real-time remote supervision, adaptive dimming responsive to environmental changes, and predictive maintenance, all of which contribute to lower operational costs and improved system reliability. As cities strive to modernize their infrastructure, the installation of connected lighting systems has accelerated, serving as a major driver for industry expansion. According to Signify?s 'Fourth Quarter and Full-Year Results 2023 Report' from January 2024, the company?s base of installed connected light points grew to 124 million, emphasizing the increasing magnitude of smart lighting networks that support the uptake of advanced solar solutions.

Additionally, favorable regulatory environments and renewable energy subsidies act as significant market drivers, with governments globally dedicating considerable funds to decrease reliance on the grid and minimize carbon footprints. These efforts are prominent in both developed cities targeting sustainability and emerging markets prioritizing off-grid electrification. For example, the San Antonio Report noted in August 2024 that the City of San Antonio authorized a contract to deploy between 200 and 400 new solar-powered LED streetlights annually through 2028 to mitigate public safety deficiencies. Internationally, financing remains a key catalyst; the World Bank approved a $35 million grant in 2024 to bolster solar energy expansion and electricity access in Guinea-Bissau, further encouraging the demand for autonomous lighting infrastructure.

Market Challenge

A primary restraint facing the Global Solar LED Street Lighting Market is the significant upfront capital expenditure necessary for photovoltaic modules and reliable battery storage systems. Although these autonomous solutions provide operational savings over time, the immediate funding required for purchase and installation exceeds that of traditional grid-connected lighting. This price gap establishes a substantial hurdle for cost-sensitive municipalities and local governments that must manage limited fiscal budgets. As a result, decision-makers frequently postpone the integration of solar infrastructure, opting instead for conventional technologies with lower entry costs, which decelerates the penetration rate of solar solutions in public lighting initiatives.

The impact of this financial challenge is further intensified by a contracting investment

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climate that restricts capital availability for such infrastructure projects. According to data from the Global Off-Grid Lighting Association in 2024, global investment in off-grid solar enterprises fell by 30 percent relative to the prior year. This reduction in financial inflows directly impedes the market's capacity to scale, as stakeholders find it difficult to obtain the liquidity needed to cover the disparity between high initial costs and long-term returns, effectively stalling the wider deployment of solar street lighting technologies.

Market Trends

The industry is witnessing a significant transition toward Lithium Iron Phosphate (LiFePO4) battery technology, which is upgrading the efficiency and reliability of autonomous lighting systems by replacing traditional lead-acid and gel chemistries. This migration is motivated by the superior thermal stability and depth-of-discharge attributes of LiFePO4 cells, which are essential for preserving consistent illumination in severe outdoor environments where temperature shifts often damage conventional storage units. The improved cycle life of this technology notably lowers the frequency of maintenance, providing a reduced total cost of ownership for municipal projects. As highlighted in a May 2025 article by Topwell Power, 'The Role of LiFePO? Batteries in Modern Solar Street Lighting', these batteries typically sustain over 2000 charge-discharge cycles, ensuring operational durability that greatly surpasses legacy options.

Concurrently, the increasing preference for compact all-in-one integrated designs is simplifying installation procedures and improving the visual appeal of public infrastructure. By combining the photovoltaic panel, LED luminaire, battery, and controller into a single unified housing, these units remove the necessity for the intricate cabling and heavy mounting hardware typical of split systems. This trend is gaining further momentum as manufacturers embed sustainable materials into these compact forms to support urban circular economy objectives. For instance, InsiderPH reported in October 2025 in the article 'Signify unveils solar streetlights to boost campus, walkway safety' that the newly released SunStay Pro mini features an all-in-one die-cast housing made from 80 percent recycled aluminum, demonstrating how integrated designs are advancing to satisfy both functional and environmental requirements.

Key Market Players

Signify Holding

Anhui Longvolt Energy Co. Ltd.

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Solar Electric Power Company

Su-Kam Power Systems Ltd.

BISOL Group d.o.o.

Greenshine New Energy

Solar Lighting International

Solar G

Orion Solar

Solex Energy Limited

Report Scope

In this report, the Global Solar LED Street Lighting Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Solar LED Street Lighting Market, By Application

Commercial Lighting and Others

Solar LED Street Lighting Market, By Lighting Type

CFL and LED

Solar LED Street Lighting Market, By Product Type

Stand alone and On grid

Solar LED Street Lighting Market, By Region

North America

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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

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South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Solar LED Street Lighting Market.

Available Customizations:

Global Solar LED Street Lighting 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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