

# **Indoor Farming LED Systems Market Forecasts to 2034 – Global Analysis By System Type (Full-Spectrum LED Grow Light Systems, Targeted Spectrum LED Systems (Red-Blue, UV & Far-Red Supplemental LED Systems. Vertical Farming LED Rack Systems and Greenhouse Supplemental LED Systems), Component, Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Indoor Farming LED Systems Market is accounted for \$5.8 billion in 2026 and is expected to reach \$19.4 billion by 2034 growing at a CAGR of 16.3% during the forecast period. Indoor farming LED systems refer to spectrally engineered solid-state lighting solutions comprising LED chips, optical components, thermal management assemblies, electronic drivers, and software control platforms that deliver precisely calibrated photosynthetically active radiation and supplemental spectral wavelengths to controlled environment agricultural production facilities including vertical farms, hydroponic greenhouses, and plant propagation chambers to optimize crop growth rates, nutritional profiles, flowering induction, and yield consistency independent of natural daylight availability.

Market Dynamics:

Driver:

Vertical Farm Investment Growth

Global vertical farm investment expansion is driving accelerating LED lighting system deployment as controlled environment agriculture operators scale commercial production facilities for leafy greens, herbs, and specialty crops requiring high-intensity artificial lighting to replace solar radiation across multi-tier rack growing systems. Venture capital and institutional investor commitments to vertical farming operations are generating substantial LED system procurement volumes as new large-scale facilities enter construction across North America, Europe, and Asia Pacific markets.

Restraint:

#### High Energy Consumption Costs

High electricity consumption costs represent the primary operating expense constraint for indoor farming facilities utilizing LED lighting systems, with lighting energy expenses accounting for substantial proportions of total crop production costs that challenge commercial viability particularly in high-electricity-tariff markets. Despite LED efficiency advantages over legacy HPS lighting, electricity cost burden continues to limit profitable crop selection to high-value specialty produce categories and restrict geographic viability of commercial vertical farming to regions with competitive power pricing.

Opportunity:

#### Smart Lighting Recipe Platforms

AI-driven light recipe optimization platform development represents a premium-value differentiation opportunity as LED system manufacturers integrate spectral control software enabling growers to dynamically adjust wavelength composition, photoperiod timing, and light intensity throughout crop growth cycles to optimize specific quality parameters including flavonoid content, anthocyanin concentration, and yield efficiency based on continuously updated agronomic data models validated through commercial growing trials.

Threat:

#### Outdoor Farm Cost Competition

Structural economic disadvantage relative to field-grown produce from favorable-climate agricultural regions represents a fundamental competitive threat to indoor farming LED system market expansion as cost-efficient outdoor production continues to dominate

food system supply for commodity produce categories where premium quality differentiation justifications are insufficient to support indoor farming's substantially higher per-unit production economics at retail price points accessible to mainstream grocery consumers.

#### Covid-19 Impact:

COVID-19 supply chain disruptions and food system vulnerability awareness accelerated institutional investment in controlled environment agriculture as a food security resilience strategy, generating significant capital deployment into vertical farming infrastructure including LED lighting system procurement. Pandemic-era local food production emphasis strengthened policy support for urban agriculture investment. Post-pandemic food system localization commitments and ESG investment criteria favoring sustainable agriculture continue to sustain indoor farming infrastructure capital allocation.

The greenhouse supplemental LED systems segment is expected to be the largest during the forecast period

The greenhouse supplemental LED systems segment is expected to account for the largest market share during the forecast period, due to the substantially larger existing installed base of commercial greenhouse horticultural operations globally relative to vertical farming facilities, combined with economically favorable supplemental lighting return-on-investment calculations for established greenhouse growers extending production seasons and improving crop quality during low-light winter periods across major greenhouse horticulture regions in Europe and North America.

The hardware segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the hardware segment is predicted to witness the highest growth rate, driven by rapid LED chip efficiency improvement enabling new high-efficacy fixture designs that deliver significantly improved photon delivery per watt of electricity consumed, combined with expanding deployment of integrated thermal management systems, multi-channel spectral control electronics, and modular rack-mounted LED fixture architectures that reduce installation costs and enable flexible system configuration across diverse indoor farming facility designs.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, due to the United States hosting the world's largest concentration of commercial vertical farming operations and controlled environment greenhouse infrastructure, combined with leading LED horticultural lighting companies including Fluence, Gavita, and Current by GE, strong venture capital investment in agtech innovation, and supportive federal agricultural research funding for controlled environment agriculture technology development.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, due to rapidly expanding vertical farming investment in Japan, China, South Korea, and Singapore driven by food security policy priorities, limited arable land availability, and government subsidized agtech development programs, combined with large domestic greenhouse horticulture sectors in China and India adopting LED supplemental lighting upgrades from legacy HPS lighting installations to improve energy efficiency and crop productivity.

Key players in the market

Some of the key players in Indoor Farming LED Systems Market include Signify (Philips Horticulture LED), Osram (ams OSRAM), Gavita (Hawthorne Gardening / Scott's), Fluence (Signify), Heliospectra, Sollum Technologies, Plessey Semiconductors, Lumileds, Seoul Semiconductor, Current by GE, Lumigrow, Illumitex, Harvest Right, TotalGrow, Advanced Lighting Technologies, Cree (Wolfspeed), and Valoya.

Key Developments:

In March 2026, Signify (Philips Horticulture LED) launched GreenPower LED toplighting with integrated far-red spectrum capability providing commercial greenhouse growers enhanced flowering induction control and accelerated crop development timing for year-round production.

In February 2026, Fluence (Signify) introduced an AI-powered light recipe management platform enabling vertical farm operators to autonomously optimize spectral parameters based on real-time crop sensor data and yield performance analytics.

In January 2026, Heliospectra secured a major commercial vertical farming contract

supplying dynamic LED lighting systems with precision spectral control for a large-scale leafy green production facility in the United States Pacific Northwest.

#### System Types Covered:

Full-Spectrum LED Grow Light Systems

Targeted Spectrum LED Systems (Red-Blue)

UV & Far-Red Supplemental LED Systems

Vertical Farming LED Rack Systems

Greenhouse Supplemental LED Systems

#### Components Covered:

Hardware

Software & Platforms

Services

#### Technologies Covered:

Standard LED Technology

Smart & Connected LED

Chip-on-Board (COB) LED

Quantum Dot LED

UV-A & UV-B Specialized LED

Far-Red & Infrared LED

## Dual-Band & Pulsed LED Technology

### Applications Covered:

Leafy Greens & Herbs

Fruits & Fruiting Vegetables

Microgreens & Sprouts

Flowering & Ornamental Crops

Cannabis & Hemp Cultivation

Pharmaceutical & Nutraceutical Crop Production

Plant Propagation & Tissue Culture

### End Users Covered:

Commercial Vertical Farm Operators

Greenhouse Horticultural Growers

Research Institutes & Universities

Home & Hobbyist Growers

Retail Garden Centers

### Regions Covered:

North America

United States

Canada

Mexico

## Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

## Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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