Grow Lights Market by Offering (Hardware, Software & Services), Wattage (<300, >=300), Spectrum (Full Spectrum, Limited Spectrum), Cultivated Plant, Installation Type, Lighting Type, Sales Channel, Application and Region - Global Forecast to 2029

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Report description:

The grow lights market is expected to reach USD 6.4 billion by 2029 from USD 2.0 billion in 2024, at a CAGR of 26.5% during the 2024-2029 period.
LED grow lights have surpassed conventional lighting technologies in energy efficiency, lifespan, versatility, and color quality. With their increasing cost competitiveness, they're widely adopted in applications like vertical farms, indoor farms, and greenhouses, catering to various plant needs with different types, shapes, sizes, prices, and colors. LED grow lights outshine traditional high-intensity discharge (HID) lamps in energy efficiency and lifespan, offering a longer operating life of nearly 50,000 hours and consuming 50% to 85% less electricity. Their ability to emit specific spectrums tailored to plant requirements maximizes growth potential and nutritional value while reducing energy costs. Additionally, LEDs are lighter, easier to install, and less heat-emitting, ensuring plants remain unharmed even when placed in proximity. Their resistance to vibrations, thermal shocks, water, and moisture makes them ideal for greenhouse environments. These attributes, coupled with advancements in spectral tailoring and light distribution control, position LED grow lights as the preferred choice for year-round crop production, mitigating weather-dependent limitations of traditional farming methods.
LED grow lights play a pivotal role in enabling farmers to produce high-quality crops throughout the year, irrespective of weather conditions. Their ability to provide photosynthetically active radiation (PAR) for photosynthesis enhances plant quality and productivity, particularly in regions with limited sunlight. By optimizing light spectra for specific crops and offering greater lighting control, LED grow lights maximize yields and nutritional values while minimizing energy costs. Controlled environment agriculture (CEA), facilitated by LED lighting, allows for multiple harvests per year, with one indoor acre equivalent to several outdoor acres. The controlled environment minimizes pest infestation, post-harvest spoilage, and the impact of adverse weather conditions, ensuring high-quality, consistent yields. As climate change poses challenges to traditional farming, the adoption of CEA practices,

powered by LED grow lights, is expected to surge, driving further demand for efficient indoor horticulture solutions.

"Legalization of medicinal plants in different countries to increase in the demand of grow lights marker."

The legalization of medicinal plants, such as marijuana, has sparked a surge in the demand for grow lights, especially in areas where these plants are sanctioned. According to the report by National Conference of State Legislatures in April 2024, 24 states along with two territories and the District of Columbia, have legalized small amounts of cannabis (marijuana) for adult recreational use. Recently, legislation in Delaware, Maryland, Minnesota, Missouri, Ohio, and Rhode Island has been passed, permitting individuals aged 21 or older to possess specific quantities of cannabis. These new laws, except in Delaware, also allow individuals to cultivate marijuana at home, although the permitted number of plants varies by state. It's noteworthy that in all six of these areas, cannabis for medical purposes was legalized before recreational adult use.

In June 2022, Thailand marked a significant milestone by becoming the inaugural Asian nation to legalize cannabis. With this legislative change, cultivating and trading marijuana and hemp products, as well as utilizing plant parts for medicinal purposes, ceased to be criminal offenses. Consequently, methods such as grow tents, greenhouses, and vertical farms have become prevalent for indoor cannabis cultivation. However, all these methods necessitate the incorporation of artificial grow lights, thereby paving the way for promising market expansion opportunities.

With marijuana legalization, there's a noticeable trend among cannabis companies diversifying their product offerings. The increased legalization of cannabis cultivation has driven a higher demand for vertical farms and greenhouses, consequently boosting the need for LED-based grow lights. Cannabis grown without sunlight requires careful consideration of various factors. For instance, the heat emitted from HPS lights can damage the product, while LEDs, operating at lower temperatures, offer a solution to excessive heat emissions.

The advantages of LED lighting for cannabis growth are widely recognized: increased yields, shortened crop cycles, and consistent quality. Utilizing the appropriate blend of white, red, and blue LEDs promotes shorter, more compact cannabis plants with enhanced branching and improved THC/CBD potency.

"Fruits & Vegetables segment of grow lights market projected to record the highest market share during the forecast period."

Grow lights ensure optimal plant growth and survival by providing tailored light spectra tailored to the specific requirements of different plants. The appropriate combination of light spectrum, intensity, and duration collectively stimulates plant growth, flowering, and reproduction. Fruits and vegetables such as cucumbers, tomatoes, lettuce, mint, basil, and strawberries are predominantly cultivated in Controlled Environment Agriculture (CEA) facilities.

Outdoor cultivation of these fruits and vegetables necessitates suitable soil, favorable climatic conditions, sunlight, adequate water supply, and high-quality seeds or plant materials, typically yielding only two harvests per season. Failure to meet these conditions can result in poor-quality or inedible produce. However, in vertical farms and greenhouses, these fruits and vegetables thrive in a controlled environment with optimized water and light conditions, often without soil. Harvests in these environments are unaffected by seasonal changes, climatic fluctuations, excessive water usage, or soil variations.

During the vegetative stage, young plants require blue light for growth, while plants in the flowering stage benefit from red spectrum wavelengths, which accelerate stem growth, promote flowering, and enhance fruit and chlorophyll production. Plants respond to light shortly after germination, even before the appearance of the first leaf. Insufficient light exposure during this critical stage can lead to elongated stems and weak plant growth. Adequate spacing between plants is essential to ensure each receives sufficient light for proper growth. Red and blue wavelengths are the most utilized by plants for photosynthesis.

Strawberries are one of the most cultivated fruits in vertical farms, with the trend of vertical farming for strawberries on the rise. A single square foot of a strawberry tower foundation can accommodate around 100 strawberry plants, a significant increase compared to traditional land cultivation, with potential for further growth by increasing the height of the vertical tower.

In May 2024, Heliospectra launched 1500W MITRA X LED light featuring an increased output of 5700□mol, wide beam optics, and 3.7 efficacy. With only 2 LED lights needed to cover a standard 8m trellis, the new MITRA X reduces investment costs for vegetable growers while ensuring high output and uniformity to optimize taste and yield. The expanded MITRA X platform emphasizes modularity and versatility, catering to various environments and crops to address the diverse requirements of contemporary growers.

"New installations arse expected to have the largest market share of grow lights in the forecast period."

The demand for fresh horticultural produce is increasing due to the rapidly growing global population. This is expected to

encourage growers to set up new greenhouses and expand their existing production facilities to cultivate higher yields each year. The emergence of vertical farms, particularly in urban settings, contributes to the overall increase in horticultural output. Plants grown in vertical farms depend entirely on artificial lighting for photosynthesis; this factor drives the market for new installations. LED grow lights are preferred over traditional ones in vertical farms for increased productivity and reduced power consumption. These lights have a lower weight and are easier to configure. They emit less heat than high-intensity discharge (HID) bulbs, so the risk of plants getting burned even if LEDs are placed close to them is relatively low. Additionally, LEDs have a long operating life of nearly 50,000 hours, enabling them to be used for more than five years with 14–18 hours of daily operations.

The break-up of the profile of primary participants in the grow lights market-

- By Company Type: Tier 1 – 35%, Tier 2 – 45%, Tier 3 – 20%
- By Designation Type: C Level – 40%, Director Level – 30%, Others – 30%
- By Region Type: North America – 20%, Europe –40 %, Asia Pacific – 30%, RoW – 10%,

The major players in the grow lights market are Signify Holding (Netherlands), Gavita International B.V. (Netherlands), Heliospectra (Sweden), ams-OSRAM AG (Austria), California LightWorks (US), Hortilux Schreder (Netherlands), Valoya (Finland), ILUMINAR Lighting LLC. (US), SAVANT TECHNOLOGIES LLC. (US), Ushio Inc. (Japan), EconoLux Industries Ltd. (China), LEDVANCE GmbH (Germany), Lemnis Oreon B.V. (Netherlands), Hyperion Grow Lights (England), Sananbio (China), Dongguan LEDESTAR Opto-electronics Tech. Co., Ltd. (China), ViparSpectra (US), Kind LED Grow Lights (US), Black Dog Horticulture Technologies & Consulting (US), Agrolux B.V. (Netherlands), Sollum Technologies (Canada), Mars Hydro (China), Biological Innovation and Optimization Systems, LLC. (US), EVERLIGHT ELECTRONICS CO., LTD. (Taiwan), and NICHIA CORPORATION (Japan).

Research Coverage

The report segments the grow lights market and forecasts its size based and region. The report also provides a comprehensive review of drivers, restraints, opportunities, and challenges influencing market growth. The report also covers qualitative aspects in addition to the quantitative aspects of the market.

Reasons to buy the report:

The report will help the market leaders/new entrants in this market with information on the closest approximate revenues for the overall grow lights market and related segments. This report will help stakeholders understand the competitive landscape and gain more insights to strengthen their position in the market and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

- Analysis of key drivers (rising investments in the establishment of vertical farms, greenhouses, and advanced technologies), restraints (human health risk associated with LED grow lights), opportunities (legalization of medicinal plants in different countries), and challenges (Complexities in implementing controlled environment agriculture (CEA) technology and the demand for technical expertise)
- Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the grow lights market
- Market Development: Comprehensive information about lucrative markets – the report analyses the grow lights market across varied regions.
- Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the grow lights market
- Competitive Assessment: In-depth assessment of market shares, growth strategies, and product offerings of leading players like ams-OSRAM AG (Austria), Signify Holding (Netherlands), SAVANT TECHNOLOGIES LLC. (US), ILUMINAR Lighting LLC. (US), and Gavita International B.V. (Netherlands).

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Grow Lights Market by Offering (Hardware, Software & Services), Wattage (<300, >=300), Spectrum (Full Spectrum, Limited Spectrum), Cultivated Plant, Installation Type, Lighting Type, Sales Channel, Application and Region - Global Forecast to 2029

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