

Agrivoltaics Market to Reach USD 11.3 Bn by 2035, Expanding at a CAGR of 10.0% | Transparency Market Research

Agrivoltaics market is gaining momentum as it integrates solar energy generation with agricultural productivity for sustainable land use

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The global [agrivoltaics market](#) is projected to experience remarkable growth during the forecast period of 2025 to 2035. Valued at US\$ 4.0 Bn in 2024, the market is expected to reach US\$ 11.3 Bn by 2035, expanding at a CAGR of 10.0%. The expansion of the industry is attributed to the increasing adoption of renewable energy, growing emphasis on food security, and the evolution of sustainable farming practices that combine agriculture with solar energy generation.

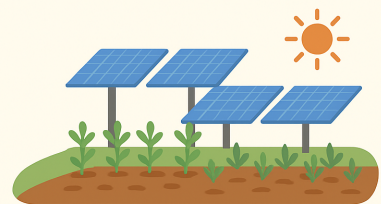
AGRIVOLTAICS MARKET OUTLOOK 2035

The agrivoltaics industry was valued at

US\$ 4.0 Bn
in 2024

It is estimated to grow at a CAGR of

10.0%
from 2025 to 2035



The Agrivoltaics market size is estimated to reach

US\$ 11.3 Bn
by the end of 2035

Agrivoltaics



Agrivoltaics: A Dual Solution for Food and Energy Security, Maximizing Land Use Efficiency While Supporting Sustainable Agriculture and Renewable Energy Generation”

*Transparency Market
Research*

Agrivoltaics — the simultaneous use of land for agriculture and solar energy production — is emerging as a key technology addressing the global challenges of land scarcity, food security, and decarbonization. The approach not only improves land-use efficiency but also enhances the economic resilience of farmers by providing dual revenue streams from crop production and renewable energy.

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Agrivoltaics, also known as solar sharing, represents a hybrid system that merges agricultural productivity with renewable energy generation. It enables simultaneous cultivation of crops and operation of photovoltaic (PV) systems on the same land parcel. By integrating solar infrastructure above or alongside agricultural activities, agrivoltaics optimizes land utilization and improves overall sustainability outcomes.

This dual-use system provides mutual benefits—farmers gain supplemental income through solar energy generation while maintaining or improving crop yields. The shading effect of solar panels reduces crop heat stress, water loss, and soil erosion while creating a favorable microclimate that supports biodiversity. Additionally, in arid and semi-arid regions, agrivoltaic systems have demonstrated potential to reduce irrigation needs by up to 50%.

Applications of agrivoltaic systems include crop farms, orchards, greenhouses, vineyards, and livestock farms, showcasing the technology's flexibility across multiple agricultural settings. Governments and private sectors globally are promoting agrivoltaics as a strategy for renewable integration and climate adaptation.

Analyst Viewpoint

According to analysts at Transparency Market Research, the agrivoltaics industry represents a transformational shift toward land-use optimization, renewable integration, and agricultural sustainability. Europe currently leads the global market due to robust policy support and substantial investments, while Asia Pacific and North America are rapidly scaling capacity through technology partnerships and pilot projects.

Crop farms dominate the agrivoltaics application landscape, given their expansive land availability and crucial role in staple food production. Notably, studies from India and Europe have shown 30–40% increases in farmer income and 20–60% yield improvements in certain crops under agrivoltaic installations.

Market leaders such as BayWa r.e AG and Sun'Agri continue to demonstrate the commercial viability of agrivoltaics through large-scale implementations and dynamic shading systems. Analysts emphasize that the technology's long-term value will lie in its integration into national net-zero strategies and sustainable land-use planning.

Key Drivers of Market Growth

1. Rising Adoption of Renewable Energy

The surge in renewable energy adoption worldwide is propelling the growth of the agrivoltaics market. According to the International Energy Agency, global solar photovoltaic capacity surpassed 1.4 terawatts (TW) in 2023 and is expected to approach 2.3 TW by 2027. Agrivoltaics

supports this momentum by enabling dual-purpose land utilization—producing clean energy while maintaining agricultural activity.

In Japan and Germany, agrivoltaic systems have achieved up to 60% of the electricity generation capacity of traditional solar farms while retaining 70–90% crop yields, underlining their efficiency and potential scalability.

2. Growing Emphasis on Food Security

The rising global population—projected to reach 9.7 billion by 2050—is driving demand for innovative farming solutions that enhance food security.

Agrivoltaics offers a sustainable alternative by facilitating simultaneous food and energy production. Research conducted in Europe and the U.S. has demonstrated 5–15% yield increases for crops like lettuce and wheat under solar installations.

In regions such as Arizona, agrivoltaic systems reduced irrigation requirements by 50%, mitigating water scarcity. Similarly, pilot projects in China, India, and South Korea have proven successful in sustaining crop growth while generating clean electricity, reinforcing agrivoltaics' role in global food-energy resilience.

3. Technological Advancements in Solar Integration

Advancements in photovoltaic cell technologies—including silicon, thin-film, organic, and perovskite solar cells—are improving efficiency, flexibility, and cost-effectiveness. Smart coatings, AI-enabled tracking systems, and IoT-based monitoring enhance solar energy conversion while optimizing shading and light exposure for crops.

Emerging R&D initiatives, such as those from Organic Electronic Technologies (OET) and Insolight, are developing adaptive solar materials and transparent PV systems that support precision agriculture applications.

Segment Analysis

By System Type

Ground-Mounted Systems: Dominant category due to scalability and ease of integration with existing farmlands.

Elevated Systems: Enable dual land use for both crops and livestock, offering greater flexibility.

Solar Greenhouses: Integrate transparent PV materials to power greenhouse operations efficiently.

By Technology

Silicon Photovoltaic Cells (Monocrystalline, Polycrystalline, Nanocrystalline)

Thin Film Photovoltaic Cells (CIGS, CdTe, Others)

Organic Solar Cells and Perovskite Technologies

By Capacity

Up to 500 kW

500 kW to 1 MW

More than 1 MW

By Application

Crop Farms: Leading application segment due to large-scale deployment for staple crop cultivation.

Horticulture Farms, Vineyards, Greenhouses, and Livestock Farms: Emerging categories leveraging agrivoltaics for sustainable productivity.

Regional Insights

Europe leads the global agrivoltaics market, supported by favorable regulatory frameworks, climate resilience policies, and large-scale renewable energy targets. The European Union aims for a 42.5% renewable energy share by 2030, driving adoption of dual-use solar systems.

France: Over 2,000 hectares converted to agrivoltaic farms; Ombrea and Sun'Agri are leading pilot installations.

Italy: The National Recovery and Resilience Plan (PNRR) allocates €1.1 Bn for agrivoltaic projects expected to add 1.04 GW of capacity by 2026.

Spain: Vineyards in Catalonia are piloting agrivoltaic systems to combat drought and maintain grape quality.

Asia Pacific is rapidly expanding, with China, India, and Japan investing in dual-use projects for rural electrification and agricultural modernization.

North America demonstrates steady adoption driven by research-backed validation and

renewable integration policies.

Latin America and the Middle East & Africa present emerging opportunities, though constrained by investment and awareness gaps.

Key Players and Industry Leaders

Prominent companies operating in the global agrivoltaics market include:

Enel Green Power, Silicon Ranch, Akuo Energy, Iberdrola S.A., BayWa r.e. AG, BELECTRIC Solar Ltd., Cero Generation Limited, Insolight, Next2Sun, Ombrea, Sun'Agri, SUNfarming, Heliene, TSE Energy, Midwest Agrivoltaic Systems, and Baofeng Group.

These players emphasize R&D, dynamic system design, and partnerships to expand dual-use solar capacity. Companies are increasingly adopting AI-based control systems and smart coatings to optimize solar energy production without compromising crop yield.

Recent Developments

SUNfarming (2024): Partnered with SPIE to construct Europe's largest agrivoltaic project, Klimapark Steinhöfel, with a capacity of 753 MWp across 500 hectares in Germany.

Akuo Energy (2024): Launched its first agrivoltaics pilot project in Portugal, FruitPV, under the Portuguese Agricultural Innovation Agenda.

BayWa r.e. AG (2023–2024): Expanded dual-use solar farms across Germany and the Netherlands, producing multi-megawatt capacities alongside crop cultivation.

Opportunities and Challenges

Opportunities:

Expansion of agrivoltaic projects in emerging economies

Technological integration with AI, IoT, and smart coatings

Policy incentives for renewable energy and sustainable farming

Increasing farmer participation and public-private collaborations

Challenges:

High initial installation costs

Need for region-specific regulatory frameworks

Limited awareness and technical training among farmers

Market Trends

Integration of Smart and Connected PV Systems: AI-driven panels adjust orientation for crop protection and energy optimization.

Focus on Climate Resilient Agriculture: Agrivoltaics mitigate heat stress and support soil moisture conservation.

Rise of Transparent and Bifacial PV Materials: Enhancing light penetration and crop growth.

Government-backed Dual-use Policies: Supporting large-scale adoption through renewable incentives.

Future Outlook

The agrivoltaics market is expected to transition from pilot-scale demonstrations to commercial-scale deployments by 2035. The technology will play a crucial role in achieving global net-zero emission targets and food-energy sustainability.

Future growth will be driven by:

Expansion of renewable infrastructure in rural regions

Increased funding for dual-use R&D projects

Integration of adaptive AI-based energy management systems

Collaborative models involving farmers, investors, and governments

Why Buy This Report?

Forecasts and CAGR analysis through 2035

In-depth assessment of drivers, restraints, and opportunities

Detailed segmentation by system type, technology, and region

Profiles of major companies and recent strategic developments

Insights into emerging trends and dual-use innovations

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