

Global Thin-Film Photovoltaic Market Size Study & Forecast, by Technology (Single-junction Thin Film, Multi-junction Thin Film), by Material (Cadmium Telluride, Amorphous Silicon), by End-User (Agricultural, Automotive) and Regional Forecasts 2025–2035

<https://marketpublishers.com/r/G5E3AFB50800EN.html>

Date: November 2025

Pages: 285

Price: US\$ 3,750.00 (Single User License)

ID: G5E3AFB50800EN

Abstracts

The Global Thin-Film Photovoltaic Market is valued approximately at USD 12.00 billion in 2024 and is anticipated to grow at a CAGR of around 12.00% over the forecast period 2025–2035. Thin-film photovoltaic (PV) technology represents the next generation of solar innovation—lightweight, flexible, and highly adaptable for diverse energy applications. Unlike traditional crystalline silicon panels, thin-film photovoltaics use semiconductor materials only a few micrometers thick, significantly reducing material costs and enabling new deployment possibilities across curved surfaces and portable energy systems. The rapid shift toward renewable energy adoption, rising electricity consumption, and favorable government policies promoting solar infrastructure are key forces propelling the global market. Moreover, the increasing emphasis on sustainable power generation in emerging economies has positioned thin-film PV as a cornerstone technology for the clean energy transition.

The surge in global energy demand, coupled with the accelerating shift toward carbon neutrality, has catalyzed the demand for thin-film photovoltaic systems. These systems are particularly valuable in off-grid and integrated applications where efficiency, portability, and aesthetics converge—such as building-integrated photovoltaics (BIPV), smart agriculture, and electric vehicle charging systems. According to the International Energy Agency (IEA), solar PV capacity additions reached over 310 GW in 2023, marking a historic milestone in global renewable energy growth. As industries strive to

decarbonize, the combination of lightweight design, superior low-light performance, and cost-effective manufacturing makes thin-film PV an attractive alternative to conventional panels. However, challenges such as lower conversion efficiency compared to crystalline silicon and recycling complexities associated with cadmium-based materials may moderately hinder growth. Despite this, ongoing advancements in multi-junction technologies and flexible module engineering are expected to open new pathways for scalability and adoption over the next decade.

The detailed segments and sub-segments included in the report are:

By Technology:

Single-junction Thin Film

Multi-junction Thin Film

By Material:

Cadmium Telluride (CdTe)

Amorphous Silicon (a-Si)

By End-User:

Agricultural

Automotive

By Region:

North America

U.S.

Canada

Europe

UK

Germany

France

Spain

Italy

Rest of Europe

Asia Pacific

China

India

Japan

Australia

South Korea

Rest of Asia Pacific

Latin America

Brazil

Mexico

Middle East & Africa

UAE

Saudi Arabia

South Africa

Rest of Middle East & Africa

Single-junction Thin Film Expected to Dominate the Market

Single-junction thin-film technology is projected to hold the dominant market share during the forecast period, primarily due to its cost-effectiveness and ease of large-scale production. This technology utilizes a single layer of semiconductor material to absorb sunlight, making it particularly suitable for mass-manufactured solar modules. Its minimal material requirement and lower energy consumption during manufacturing translate into reduced production costs—an advantage that appeals to commercial and utility-scale solar developers. Furthermore, the enhanced performance of single-junction cells under diffuse light conditions makes them ideal for regions with variable sunlight exposure. While multi-junction thin films promise higher efficiency levels, their complexity and higher manufacturing costs currently limit widespread adoption. As research continues to optimize conversion efficiency and scalability, single-junction thin films are expected to remain the backbone of global thin-film PV production through 2035.

Cadmium Telluride Material Leads in Revenue Contribution

When analyzed by material, cadmium telluride (CdTe) dominates the global thin-film photovoltaic market, accounting for the majority of revenue share. CdTe modules are recognized for their high efficiency-to-cost ratio and shorter energy payback time compared to other thin-film technologies. Their stable performance in high-temperature environments and superior absorption properties have made them a preferred choice for large-scale solar installations worldwide. Major industry players have invested heavily in optimizing CdTe's energy conversion efficiency, with some commercial modules now surpassing 22%. Meanwhile, amorphous silicon (a-Si) continues to hold significant potential for flexible and transparent solar applications, particularly in consumer electronics and smart windows. Nevertheless, CdTe's scalability, robustness, and cost advantages keep it at the forefront of the market's revenue generation.

The Global Thin-Film Photovoltaic Market demonstrates strong growth potential across key regions. Asia Pacific currently holds the largest market share, driven by aggressive renewable energy policies in China, India, and Japan, along with increasing investments in solar infrastructure and manufacturing facilities. North America follows closely, supported by the United States' ambitious solar energy targets and the expansion of utility-scale projects leveraging thin-film technology. Europe remains a key player, bolstered by stringent carbon reduction goals and incentives for decentralized renewable installations. Meanwhile, Latin America and the Middle East & Africa are emerging as promising markets, with nations such as Brazil, Saudi Arabia, and the UAE investing heavily in solar energy to diversify their energy mix. These regional dynamics collectively underscore a global movement toward cost-efficient, sustainable, and high-performing photovoltaic solutions.

Major market players included in this report are:

First Solar, Inc.

Ascent Solar Technologies, Inc.

Hanergy Thin Film Power Group Limited

Kaneka Corporation

Sharp Corporation

MiaSol? Hi-Tech Corp.

Solar Frontier K.K.

Trina Solar Co., Ltd.

Flisom AG

Global Solar Energy, Inc.

Oxford Photovoltaics Ltd.

CNBM Group Co., Ltd.

Panasonic Holdings Corporation

SunPower Corporation

Avancis GmbH

Global Thin-Film Photovoltaic Market Report Scope:

Historical Data – 2023, 2024

Base Year for Estimation – 2024

Forecast period – 2025–2035

Report Coverage – Revenue forecast, Company Ranking, Competitive Landscape, Growth factors, and Trends

Regional Scope – North America; Europe; Asia Pacific; Latin America; Middle East & Africa

Customization Scope – Free report customization (equivalent to up to 8 analysts' working hours) with purchase. Addition or alteration to country, regional & segment scope*

The objective of the study is to define market sizes of different segments and countries in recent years and to forecast the values for the coming years. The report is designed to incorporate both qualitative and quantitative aspects of the industry within the countries involved in the study. The report also provides detailed information about crucial aspects such as driving factors and challenges that will define the future growth of the market. Additionally, it incorporates potential opportunities in micro-markets for stakeholders to invest, along with a detailed analysis of the competitive landscape and product offerings of key players. The detailed segments and sub-segments of the market are explained above.

Key Takeaways:

Market Estimates & Forecast for 10 years from 2025 to 2035.

Annualized revenues and regional-level analysis for each market segment.

Detailed analysis of the geographical landscape with country-level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of the competitive structure of the market.

Demand side and supply side analysis of the market.

Contents

CHAPTER 1. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET REPORT SCOPE & METHODOLOGY

- 1.1. Research Objective
- 1.2. Research Methodology
 - 1.2.1. Forecast Model
 - 1.2.2. Desk Research
 - 1.2.3. Top Down and Bottom-Up Approach
- 1.3. Research Attributes
- 1.4. Scope of the Study
 - 1.4.1. Market Definition
 - 1.4.2. Market Segmentation
- 1.5. Research Assumption
 - 1.5.1. Inclusion & Exclusion
 - 1.5.2. Limitations
 - 1.5.3. Years Considered for the Study

CHAPTER 2. EXECUTIVE SUMMARY

- 2.1. CEO/CXO Standpoint
- 2.2. Strategic Insights
- 2.3. ESG Analysis
- 2.4. key Findings

CHAPTER 3. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET FORCES ANALYSIS

- 3.1. Market Forces Shaping The Global Thin-Film Photovoltaic Market (2024-2035)
- 3.2. Drivers
 - 3.2.1. rapid shift toward renewable energy adoption
 - 3.2.2. rising electricity consumption
- 3.3. Restraints
 - 3.3.1. lower conversion efficiency compared to crystalline silicon
- 3.4. Opportunities
 - 3.4.1. favorable government policies promoting solar infrastructure

CHAPTER 4. GLOBAL THIN-FILM PHOTOVOLTAIC INDUSTRY ANALYSIS

- 4.1. Porter's 5 Forces Model
 - 4.1.1. Bargaining Power of Buyer
 - 4.1.2. Bargaining Power of Supplier
 - 4.1.3. Threat of New Entrants
 - 4.1.4. Threat of Substitutes
 - 4.1.5. Competitive Rivalry
- 4.2. Porter's 5 Force Forecast Model (2024-2035)
- 4.3. PESTEL Analysis
 - 4.3.1. Political
 - 4.3.2. Economical
 - 4.3.3. Social
 - 4.3.4. Technological
 - 4.3.5. Environmental
 - 4.3.6. Legal
- 4.4. Top Investment Opportunities
- 4.5. Top Winning Strategies (2025)
- 4.6. Market Share Analysis (2024-2025)
- 4.7. Global Pricing Analysis And Trends 2025
- 4.8. Analyst Recommendation & Conclusion

CHAPTER 5. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET SIZE & FORECASTS BY TECHNOLOGY 2025-2035

- 5.1. Market Overview
- 5.2. Global Thin-Film Photovoltaic Market Performance - Potential Analysis (2025)
- 5.3. Single-junction Thin Film
 - 5.3.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035
 - 5.3.2. Market size analysis, by region, 2025-2035
- 5.4. Multi-junction Thin Film
 - 5.4.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035
 - 5.4.2. Market size analysis, by region, 2025-2035

CHAPTER 6. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET SIZE & FORECASTS BY MATERIAL 2025-2035

- 6.1. Market Overview
- 6.2. Global Thin-Film Photovoltaic Market Performance - Potential Analysis (2025)
- 6.3. Cadmium Telluride (CdTe)
 - 6.3.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035

- 6.3.2. Market size analysis, by region, 2025-2035
- 6.4. Amorphous Silicon (a-Si)
 - 6.4.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035
 - 6.4.2. Market size analysis, by region, 2025-2035

CHAPTER 7. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET SIZE & FORECASTS BY END USER 2025–2035

- 7.1. Market Overview
- 7.2. Global Thin-Film Photovoltaic Market Performance - Potential Analysis (2025)
- 7.3. Agricultural
 - 7.3.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035
 - 7.3.2. Market size analysis, by region, 2025-2035
- 7.4. Automotive
 - 7.4.1. Top Countries Breakdown Estimates & Forecasts, 2024-2035
 - 7.4.2. Market size analysis, by region, 2025-2035

CHAPTER 8. GLOBAL THIN-FILM PHOTOVOLTAIC MARKET SIZE & FORECASTS BY REGION 2025–2035

- 8.1. Growth Thin-Film Photovoltaic Market, Regional Market Snapshot
- 8.2. Top Leading & Emerging Countries
- 8.3. North America Thin-Film Photovoltaic Market
 - 8.3.1. U.S. Thin-Film Photovoltaic Market
 - 8.3.1.1. Technology breakdown size & forecasts, 2025-2035
 - 8.3.1.2. Material breakdown size & forecasts, 2025-2035
 - 8.3.1.3. End User breakdown size & forecasts, 2025-2035
 - 8.3.2. Canada Thin-Film Photovoltaic Market
 - 8.3.2.1. Technology breakdown size & forecasts, 2025-2035
 - 8.3.2.2. Material breakdown size & forecasts, 2025-2035
 - 8.3.2.3. End User breakdown size & forecasts, 2025-2035
- 8.4. Europe Thin-Film Photovoltaic Market
 - 8.4.1. UK Thin-Film Photovoltaic Market
 - 8.4.1.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.1.2. Material breakdown size & forecasts, 2025-2035
 - 8.4.1.3. End User breakdown size & forecasts, 2025-2035
 - 8.4.2. Germany Thin-Film Photovoltaic Market
 - 8.4.2.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.2.2. Material breakdown size & forecasts, 2025-2035

- 8.4.2.3. End User breakdown size & forecasts, 2025-2035
- 8.4.3. France Thin-Film Photovoltaic Market
 - 8.4.3.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.3.2. Material breakdown size & forecasts, 2025-2035
 - 8.4.3.3. End User breakdown size & forecasts, 2025-2035
- 8.4.4. Spain Thin-Film Photovoltaic Market
 - 8.4.4.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.4.2. Material breakdown size & forecasts, 2025-2035
 - 8.4.4.3. End User breakdown size & forecasts, 2025-2035
- 8.4.5. Italy Thin-Film Photovoltaic Market
 - 8.4.5.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.5.2. Material breakdown size & forecasts, 2025-2035
 - 8.4.5.3. End User breakdown size & forecasts, 2025-2035
- 8.4.6. Rest of Europe Thin-Film Photovoltaic Market
 - 8.4.6.1. Technology breakdown size & forecasts, 2025-2035
 - 8.4.6.2. Material breakdown size & forecasts, 2025-2035
 - 8.4.6.3. End User breakdown size & forecasts, 2025-2035
- 8.5. Asia Pacific Thin-Film Photovoltaic Market
 - 8.5.1. China Thin-Film Photovoltaic Market
 - 8.5.1.1. Technology breakdown size & forecasts, 2025-2035
 - 8.5.1.2. Material breakdown size & forecasts, 2025-2035
 - 8.5.1.3. End User breakdown size & forecasts, 2025-2035
 - 8.5.2. India Thin-Film Photovoltaic Market
 - 8.5.2.1. Technology breakdown size & forecasts, 2025-2035
 - 8.5.2.2. Material breakdown size & forecasts, 2025-2035
 - 8.5.2.3. End User breakdown size & forecasts, 2025-2035
 - 8.5.3. Japan Thin-Film Photovoltaic Market
 - 8.5.3.1. Technology breakdown size & forecasts, 2025-2035
 - 8.5.3.2. Material breakdown size & forecasts, 2025-2035
 - 8.5.3.3. End User breakdown size & forecasts, 2025-2035
 - 8.5.4. Australia Thin-Film Photovoltaic Market
 - 8.5.4.1. Technology breakdown size & forecasts, 2025-2035
 - 8.5.4.2. Material breakdown size & forecasts, 2025-2035
 - 8.5.4.3. End User breakdown size & forecasts, 2025-2035
 - 8.5.5. South Korea Thin-Film Photovoltaic Market
 - 8.5.5.1. Technology breakdown size & forecasts, 2025-2035
 - 8.5.5.2. Material breakdown size & forecasts, 2025-2035
 - 8.5.5.3. End User breakdown size & forecasts, 2025-2035
 - 8.5.6. Rest of APAC Thin-Film Photovoltaic Market

- 8.5.6.1. Technology breakdown size & forecasts, 2025-2035
- 8.5.6.2. Material breakdown size & forecasts, 2025-2035
- 8.5.6.3. End User breakdown size & forecasts, 2025-2035
- 8.6. Latin America Thin-Film Photovoltaic Market
 - 8.6.1. Brazil Thin-Film Photovoltaic Market
 - 8.6.1.1. Technology breakdown size & forecasts, 2025-2035
 - 8.6.1.2. Material breakdown size & forecasts, 2025-2035
 - 8.6.1.3. End User breakdown size & forecasts, 2025-2035
 - 8.6.2. Mexico Thin-Film Photovoltaic Market
 - 8.6.2.1. Technology breakdown size & forecasts, 2025-2035
 - 8.6.2.2. Material breakdown size & forecasts, 2025-2035
 - 8.6.2.3. End User breakdown size & forecasts, 2025-2035
- 8.7. Middle East and Africa Thin-Film Photovoltaic Market
 - 8.7.1. UAE Thin-Film Photovoltaic Market
 - 8.7.1.1. Technology breakdown size & forecasts, 2025-2035
 - 8.7.1.2. Material breakdown size & forecasts, 2025-2035
 - 8.7.1.3. End User breakdown size & forecasts, 2025-2035
 - 8.7.2. Saudi Arabia (KSA) Thin-Film Photovoltaic Market
 - 8.7.2.1. Technology breakdown size & forecasts, 2025-2035
 - 8.7.2.2. Material breakdown size & forecasts, 2025-2035
 - 8.7.2.3. End User breakdown size & forecasts, 2025-2035
 - 8.7.3. South Africa Thin-Film Photovoltaic Market
 - 8.7.3.1. Technology breakdown size & forecasts, 2025-2035
 - 8.7.3.2. Material breakdown size & forecasts, 2025-2035
 - 8.7.3.3. End User breakdown size & forecasts, 2025-2035

CHAPTER 9. COMPETITIVE INTELLIGENCE

- 9.1. Top Market Strategies
- 9.2. First Solar, Inc.
 - 9.2.1. Company Overview
 - 9.2.2. Key Executives
 - 9.2.3. Company Snapshot
 - 9.2.4. Financial Performance (Subject to Data Availability)
 - 9.2.5. Product/Services Port
 - 9.2.6. Recent Development
 - 9.2.7. Market Strategies
 - 9.2.8. SWOT Analysis
- 9.3. Ascent Solar Technologies, Inc.

- 9.4. Hanergy Thin Film Power Group Limited
- 9.5. Kaneka Corporation
- 9.6. Sharp Corporation
- 9.7. MiaSol? Hi-Tech Corp.
- 9.8. Solar Frontier K.K.
- 9.9. Trina Solar Co., Ltd.
- 9.10. Flisom AG
- 9.11. Global Solar Energy, Inc.
- 9.12. Oxford Photovoltaics Ltd.
- 9.13. CNBM Group Co., Ltd.
- 9.14. Panasonic Holdings Corporation
- 9.15. SunPower Corporation
- 9.16. Avancis GmbH

List Of Tables

LIST OF TABLES

- Table 1. Global Thin-Film Photovoltaic Market, Report Scope
- Table 2. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Region
2024–2035
- Table 3. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Segment
2024–2035
- Table 4. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Segment
2024–2035
- Table 5. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Segment
2024–2035
- Table 6. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Segment
2024–2035
- Table 7. Global Thin-Film Photovoltaic Market Estimates & Forecasts By Segment
2024–2035
- Table 8. U.S. Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 9. Canada Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 10. UK Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 11. Germany Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 12. France Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 13. Spain Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 14. Italy Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 15. Rest Of Europe Thin-Film Photovoltaic Market Estimates & Forecasts,
2024–2035
- Table 16. China Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 17. India Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 18. Japan Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 19. Australia Thin-Film Photovoltaic Market Estimates & Forecasts, 2024–2035
- Table 20. South Korea Thin-Film Photovoltaic Market Estimates & Forecasts,
2024–2035
-

List Of Figures

LIST OF FIGURES

- Fig 1. Global Thin-Film Photovoltaic Market, Research Methodology
- Fig 2. Global Thin-Film Photovoltaic Market, Market Estimation Techniques
- Fig 3. Global Market Size Estimates & Forecast Methods
- Fig 4. Global Thin-Film Photovoltaic Market, Key Trends 2025
- Fig 5. Global Thin-Film Photovoltaic Market, Growth Prospects 2024–2035
- Fig 6. Global Thin-Film Photovoltaic Market, Porter’s Five Forces Model
- Fig 7. Global Thin-Film Photovoltaic Market, Pestel Analysis
- Fig 8. Global Thin-Film Photovoltaic Market, Value Chain Analysis
- Fig 9. Thin-Film Photovoltaic Market By Application, 2025 & 2035
- Fig 10. Thin-Film Photovoltaic Market By Segment, 2025 & 2035
- Fig 11. Thin-Film Photovoltaic Market By Segment, 2025 & 2035
- Fig 12. Thin-Film Photovoltaic Market By Segment, 2025 & 2035
- Fig 13. Thin-Film Photovoltaic Market By Segment, 2025 & 2035
- Fig 14. North America Thin-Film Photovoltaic Market, 2025 & 2035
- Fig 15. Europe Thin-Film Photovoltaic Market, 2025 & 2035
- Fig 16. Asia Pacific Thin-Film Photovoltaic Market, 2025 & 2035
- Fig 17. Latin America Thin-Film Photovoltaic Market, 2025 & 2035
- Fig 18. Middle East & Africa Thin-Film Photovoltaic Market, 2025 & 2035
- Fig 19. Global Thin-Film Photovoltaic Market, Company Market Share Analysis (2025)

.....

I would like to order

Product name: Global Thin-Film Photovoltaic Market Size Study & Forecast, by Technology (Single-junction Thin Film, Multi-junction Thin Film), by Material (Cadmium Telluride, Amorphous Silicon), by End-User (Agricultural, Automotive) and Regional Forecasts 2025–2035

Product link: <https://marketpublishers.com/r/G5E3AFB50800EN.html>

Price: US\$ 3,750.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G5E3AFB50800EN.html>