

The Global Market for Perovskite Materials and Technologies 2025-2035

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Abstracts

The global market for perovskite materials and technologies is experiencing rapid growth and attracting significant attention from researchers, industries, and investors worldwide. Perovskites, a class of materials with a unique crystalline structure, have emerged as a promising solution for various applications due to their exceptional optoelectronic properties, low-cost production, and versatility. The primary driver of the perovskite market is the increasing demand for high-efficiency, cost-effective, and sustainable energy solutions. Perovskite solar cells (PSCs) have demonstrated remarkable progress in recent years, with power conversion efficiencies now exceeding 25% (from 3% in 2009) in laboratory settings. This positions PSCs as a potential challenger to traditional silicon-based photovoltaics. The ability to produce perovskite films through low-temperature, solution-based processes makes them attractive for scalable manufacturing and integration with flexible substrates. They offer low production costs, high energy efficiency, and adaptability for flexible and glass substrates.

Beyond photovoltaics, perovskites are finding applications in light-emitting devices (LEDs), photodetectors, sensors, transistors, memory devices, and catalysis. Perovskite LEDs, known as PeLEDs, offer high color purity, tunability, and low-cost fabrication, making them suitable for display and lighting applications. Perovskite-based photodetectors and sensors exhibit high sensitivity, wide spectral response, and fast response times, with potential uses in imaging, surveillance, and environmental monitoring.

The perovskite market is still in its early stages. However, the market is expected to grow significantly in the coming years, driven by the increasing adoption of perovskite-based products and the scaling up of manufacturing processes. The global perovskite

market will exceed \$10 billion by 2035, with the photovoltaics segment accounting for the largest share. The future outlook for perovskite materials and technologies is promising, with ongoing research focused on improving stability, durability, and performance. Tandem architectures, combining perovskites with other established technologies like silicon or CIGS, are expected to push power conversion efficiencies. Flexible and wearable perovskite devices, such as solar-powered clothing and sensors, are also on the horizon. Perovskite quantum dots are attracting interest for their potential in display and lighting applications, offering improved color gamut and energy efficiency compared to conventional materials.

However, challenges remain in terms of long-term stability/efficiency, scalability, and the presence of toxic lead in some perovskite formulations. Researchers are actively exploring lead-free alternatives and encapsulation techniques to address these concerns.

The report covers the following key aspects:

Overview of perovskite materials and their unique properties

Types of perovskites: inorganic, hybrid organic-inorganic, and perovskite quantum dots

Advantages of perovskites over traditional materials

Perovskite applications and end-use markets

Photovoltaics: perovskite solar cells (PSCs), tandem solar cells, and building-integrated photovoltaics (BIPV)

Light-emitting devices: perovskite LEDs (PeLEDs), white light-emitting devices, lasers, and optical amplifiers

Photodetectors and sensors: visible light, X-ray, gamma-ray, chemical, and humidity sensors

Transistors and memory devices: field-effect transistors (FETs) and resistive random-access memory (RRAM)

Catalysis and photocatalysis: water splitting, hydrogen production, CO₂

reduction, and pollutant degradation

Thermoelectrics and other emerging applications

Perovskite synthesis and processing methods

Solution-based methods: one-step deposition, two-step sequential deposition, and anti-solvent assisted crystallization

Vapor deposition methods: thermal evaporation, co-evaporation, and chemical vapor deposition (CVD)

Scalable processing techniques: inkjet printing, blade coating, slot-die coating, and spray coating

Roll-to-roll processing for high-volume production and cost reduction

Post-synthesis processing techniques: thermal annealing, solvent annealing, and pressure-assisted annealing

Market drivers and restraints

Market forecasts and regional analysis

Global perovskite materials and technologies market size and growth rate from 2025 to 2035

Market segmentation by application, material type, and geographic region

Detailed market forecasts for North America, Europe, Asia-Pacific, and the Rest of the World

Competitive landscape and company profiles

Profiles of over 65 key players in the perovskite industry, including material suppliers and device manufacturers. Companies profiled include Aisin Corporation, Anker, Ascent Solar, Astronergy, Avantama, Beyond Silicon, Caelux, BrightComSol, Canadian Solar, Canon, China Huaneng Group Co., Ltd., Cosmos Innovation, CubicPV, DaZheng, Dyenamo, EneCoat

Technologies, Energy Materials Corporation, Ergis Group, Flexell Space, GCL, Green Science Alliance Co., Ltd., Hangzhou Xianna Optoelectronic Technology Co., Ltd., Hanwha Qcells, Hefei BOE Solar Technology, Helio Display Materials, HETE Photo Electricity, Hiking PV, Homerun Resources, Huasun Energy (Ningxia Huasun New Materials Technology), JA Solar, Jiangsu Xiehang Energy Technology (Fellow Energy/Xiehang Energy), Jinko Solar, Kaneka Corporation, Koreakiyon, LONGi Green Energy Technology, Mellow Energy, Microquanta Semiconductor, Nanolumi, Nexwafe, Opteria, Oxford PV, PEROLED Korea, PeroNova, Perovskia Solar, Power Roll, PXP, Renshine Solar, RISEN, Saule Technologies, SCHOTT, SEI Energy Technology (Jiaxing), Sekisui Chemical Co Ltd, SN Display Co., Ltd., Sofab Inks, Solaronix, Solaveni GmbH, Solaires Enterprises, and more....

Analysis of their strategies, partnerships, and product offerings

Regulations and environmental considerations

Future trends and opportunities

Tandem solar cells and perovskite-silicon integration

Flexible and wearable perovskite devices

Perovskite quantum dots for displays and lighting

Perovskite-based sensors for IoT and smart cities

Recyclable and eco-friendly perovskite materials

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market Overview
- 1.2 Technology roadmap
- 1.3 Market drivers and restraints
 - 1.3.1 Market Drivers
 - 1.3.1.1 Increasing Demand for Renewable Energy
 - 1.3.1.2 Declining Costs of Perovskite Production
 - 1.3.1.3 Government Policies and Incentives
 - 1.3.1.4 Advancements in Perovskite Stability and Efficiency
 - 1.3.2 Market Restraints
 - 1.3.2.1 Lead Toxicity Concerns
 - 1.3.2.2 Stability and Degradation Issues
 - 1.3.2.3 Scalability and Manufacturing Challenges
 - 1.3.2.4 Competition from Established Technologies
- 1.4 Market opportunities and future trends
 - 1.4.1 Tandem Solar Cells and Perovskite-Silicon Integration
 - 1.4.2 Flexible and Wearable Perovskite Devices
 - 1.4.3 Perovskite Quantum Dots for Displays and Lighting
 - 1.4.4 Perovskite-Based Sensors for IoT and Smart Cities
 - 1.4.5 Perovskite Materials for Neuromorphic Computing
 - 1.4.6 Recyclable and Eco-Friendly Perovskites
- 1.5 Market forecasts
 - 1.5.1 Global Perovskite Materials and Technologies Market Size and Growth Rate
 - 1.5.2 Market Forecasts by Application
 - 1.5.3 Market Forecasts by Region
 - 1.5.3.1 North America
 - 1.5.3.2 Europe
 - 1.5.3.3 China
 - 1.5.3.4 Asia-Pacific
 - 1.5.3.5 Rest of World
- 1.6 Regulations
 - 1.6.1 Regulations and Standards for Perovskite Materials
 - 1.6.2 Toxicity and Environmental Concerns
 - 1.6.3 Disposal and Recycling Strategies
 - 1.6.4 Occupational Health and Safety Measures

2 INTRODUCTION

2.1. What are Perovskites?

2.1.1. Perovskite Structure and Composition

2.1.1 Types of Perovskites

2.1.1.1 Inorganic Perovskites

2.1.1.2 Hybrid Organic-Inorganic Perovskites

2.1.2 Perovskite Properties

2.2 Advantages of Perovskite Materials

2.3 Challenges and Limitations

3 PEROVSKITE MATERIALS

3.1 Inorganic Perovskites

3.1.1 Lead-Based Perovskites

3.1.1.1 Methylammonium Lead Triiodide (MAPbI₃)

3.1.1.2 Formamidinium Lead Triiodide (FAPbI₃)

3.1.1.3 Cesium Lead Triiodide (CsPbI₃)

3.1.2 Lead-Free Perovskites

3.1.2.1 Tin-Based Perovskites

3.1.2.2 Bismuth-Based Perovskites

3.1.2.3 Double Perovskites

3.1.3 Other Inorganic Perovskites

3.2 Hybrid Organic-Inorganic Perovskites

3.2.1 3D Hybrid Perovskites

3.2.2 2D Hybrid Perovskites (Ruddlesden-Popper Phases)

3.2.3 Quasi-2D Hybrid Perovskites

3.2.4 1D Hybrid Perovskites

3.2.5 Perovskite Quantum Dots

3.2.5.1 Properties

3.2.5.2 Comparison to conventional quantum dots

3.2.5.3 Synthesis methods

3.2.5.4 Applications

4 PEROVSKITE SYNTHESIS AND PROCESSING METHODS

4.1 Overview - Deposition of perovskites

4.2 Solution-Based Methods

4.2.1 One-Step Deposition

- 4.2.2 Two-Step Sequential Deposition
- 4.2.3 Anti-Solvent Assisted Crystallization
- 4.2.4 Vapor-Assisted Solution Process
- 4.2.5 Spin Coating
- 4.3 Vapor Deposition Methods
 - 4.3.1 Thermal Evaporation
 - 4.3.2 Co-Evaporation
 - 4.3.3 Chemical Vapor Deposition (CVD)
 - 4.3.4 Hybrid Chemical Vapor Deposition
 - 4.3.5 Aerosol Assisted Chemical Vapor Deposition
 - 4.3.6 Sputtering
- 4.4 Other Synthesis Methods
 - 4.4.1 Mechanochemical Synthesis
 - 4.4.2 Combustion Synthesis
 - 4.4.3 Hydrothermal Synthesis
- 4.5 Deposition Techniques for Scalable Processing
 - 4.5.1 Inkjet Printing
 - 4.5.2 Blade Coating
 - 4.5.3 Slot-Die Coating
 - 4.5.4 Spray Coating
- 4.6 Roll-to-Roll Processing
 - 4.6.1 Overview of Roll-to-Roll Printing for Perovskites
 - 4.6.2 Advantages for High-Volume Production and Cost Reduction
 - 4.6.3 Challenges in Perovskite Film Deposition
 - 4.6.4 Examples of Roll-to-Roll Perovskite Device Fabrication
- 4.7 Patented and Proprietary Deposition Methods
- 4.8 Post-Synthesis Processing Techniques
 - 4.8.1 Thermal Annealing
 - 4.8.2 Solvent Annealing
 - 4.8.3 Pressure-Assisted Annealing
- 4.9 Comparison of Deposition Methods
 - 4.9.1 Overview of Method Advantages and Limitations
 - 4.9.2 Guidelines for Choosing a Perovskite Deposition Method

5 PEROVSKITE APPLICATIONS AND END-USE MARKETS

- 5.1 Photovoltaics
 - 5.1.1 Global solar power market
 - 5.1.2 Thin film solar cells

- 5.1.3 Thin Film Perovskite Solar Cells (PSCs)
 - 5.1.3.1 PSC Architectures and Device Structures
 - 5.1.3.2 Advantages of PSCs over Silicon Solar Cells
 - 5.1.3.3 Challenges and Stability Issues
 - 5.1.3.4 Perovskite stability
 - 5.1.3.5 Additive engineering
 - 5.1.3.6 Glass-glass encapsulation
 - 5.1.3.7 Polymer encapsulation
 - 5.1.3.8 Perovskite PV value chain
- 5.1.4 Tandem Solar Cells
 - 5.1.4.1 Applications
 - 5.1.4.2 Perovskite/silicon tandem solar cells
 - 5.1.4.2.1 Building integration
 - 5.1.4.2.2 Solar farms
 - 5.1.4.2.3 Companies
 - 5.1.4.3 All Perovskite Tandem Solar Cells
 - 5.1.4.3.1 Overview
 - 5.1.4.3.2 Companies
- 5.1.5 Materials
 - 5.1.5.1 Substrate materials
 - 5.1.5.1.1 Rigid glass substrates
 - 5.1.5.1.2 Flexible glass substrates
 - 5.1.5.1.3 Plastic substrates
 - 5.1.5.1.4 Transparent conducting films
- 5.1.6 Building-Integrated Photovoltaics (BIPV)
- 5.1.7 Space and Aerospace Applications
- 5.1.8 Indoor energy harvesting
- 5.1.9 Agrivoltaics
- 5.1.10 Market players
- 5.1.11 Global perovskite PV market to 2035
- 5.2 Light-Emitting Devices
 - 5.2.1 Light emitting diodes market
 - 5.2.2 Perovskite Light-Emitting Diodes (PeLEDs)
 - 5.2.2.1 Applications
 - 5.2.3 White Light-Emitting Devices
 - 5.2.4 Lasers and Optical Amplifiers
- 5.3 Photodetectors and Sensors
 - 5.3.1 Thin film photodetectors market
 - 5.3.2 Visible Light Photodetectors

- 5.3.3 X-Ray Detectors
- 5.3.4 Gamma-Ray Detectors
- 5.3.5 Chemical Sensors
- 5.3.6 Humidity Sensors
- 5.4 Transistors and Memory Devices
 - 5.4.1 Field-Effect Transistors (FETs)
 - 5.4.2 Resistive Random-Access Memory (RRAM)
- 5.5 Catalysis and Photocatalysis
 - 5.5.1 Water Splitting and Hydrogen Production
 - 5.5.2 CO₂ Reduction and Conversion
 - 5.5.3 Organic Synthesis
 - 5.5.4 Pollutant Degradation
- 5.6 Thermoelectrics
- 5.7 Other Emerging Applications
 - 5.7.1 Piezoelectrics
 - 5.7.2 Superconductors
 - 5.7.3 Spintronics
 - 5.7.4 Batteries and Supercapacitors

6 COMPANY PROFILES 182 (68 COMPANY PROFILES)

7 APPENDICES

- 7.1 12. List of Abbreviations
- 7.2 Research Methodology

8 REFERENCES

12. LIST OF TABLES

- Table 1. Market overview for Perovskite Materials and Technologies.
- Table 2. Perovskite production costs.
- Table 3. Perovskite materials and technologies versus established technologies, by market.
- Table 4. Perovskite Materials and Technologies Market Forecasts by Application, 2022-2035.
- Table 5. Perovskite PV companies in China.
- Table 6. Perovskite Properties.
- Table 7. Advantages of Perovskite Materials.

Table 8. Perovskite quantum dots (PQDs) overview.

Table 9. Comparative properties of conventional QDs and Perovskite QDs.

Table 10. Applications of perovskite QDs.

Table 11. Development roadmap for perovskite QDs.

Table 12. Properties of perovskite QLEDs comparative to OLED and QLED.

Table 13. Perovskite-based QD producers.

Table 14. Total installed solar capacity by technology type, 2024-2035.

Table 15. Benchmarking of solar technologies.

Table 16. Perovskite solar power funding and projects.

Table 17. Comparison of thin film technologies.

Table 18. n-i-p vs p-i-n configurations.

Table 19. Thin film vs tandem perovskite PV.

Table 20. Perovskite/silicon tandem PV market players.

Table 21. Global installed perovskite PV capacity by application, 2023-2035.

Table 22. Global perovskite PV annual revenues, 2023-2035.

Table 23. Global solar farm installation capacity, 2024-2035.

Table 24. Global Perovskite solar farm revenues, 2024-2035.

Table 25. Global Perovskite residential rooftop PV revenues, 2024-2035.

Table 26. Applications of Perovskite LEDs.

Table 27. Photodetector applications.

12. LIST OF FIGURES

Figure 1. Technology roadmap for perovskite materials.

Figure 2. Perovskite Materials and Technologies Market Forecasts by Application, 2022-2035.

Figure 3. Perovskite Materials and Technologies Market Forecasts by Region, 2022-2035.

Figure 4. Perovskite solar cell by Toshiba.

Figure 5. A pQLED device structure.

Figure 6. Perovskite quantum dots under UV light.

Figure 7. Roll-to-roll manufacturing process.

Figure 8. Total installed solar capacity by technology type, 2024-2035.

Figure 9. Perovskite PV value chain

Figure 10. Global installed perovskite PV capacity by application, 2023-2035.

Figure 11. Global perovskite PV annual revenues, 2023-2035.

Figure 12. Global solar farm installation capacity, 2024-2035.

Figure 13. Global Perovskite solar farm revenues, 2024-2035.

Figure 14. Global Perovskite residential rooftop PV revenues, 2024-2035.

Figure 15. Working principle of perovskite LEDs.

Figure 16. Working principle of photodetectors.

Figure 17. Perovskite absorption spectrum

Figure 18. Siemens Healthineers perovskite x-ray detectors.

Figure 19. Anker solar umbrella.

Figure 20. EneCoat Technologies Co., Ltd. perovskite solar cells.

Figure 21. Kaneka Corporation built-in perovskite solar cells.

Figure 22. Uchisaiwaicho 1-chome Urban District Development Project.

Figure 23. Sekisui film-type perovskite solar cells.

Figure 24. UtmoLight 450W perovskite solar module.

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