

India Graphene Market Size and Forecast (2021 - 2031), Country Share, Trend, and Growth Opportunity Analysis Report Coverage: By Application (Composites, Concrete, Battery Additives, and Others), and End-Use Industry (Electric Vehicles, Building and Construction, Paints and Coatings, Aerospace and Defense, and Others), and Region

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Abstracts

The India graphene market size was valued at US\$ 77.73 million in 2024 and is projected to reach US\$ 234.85 million by 2031; it is expected to register a CAGR of 17.2% from 2025 to 2031.

The demand for graphene in India is rising significantly due to its exceptional physical, electrical, and mechanical properties, making it ideal for advanced electronics and energy storage applications. Graphene boasts excellent electrical conductivity, lightweight, mechanical strength, and flexibility, which enable it to enhance the performance of batteries, supercapacitors, flexible electronics, and energy devices. As India increasingly adopts renewable energy and electric vehicles (EVs), the need for efficient, durable, and lightweight energy storage solutions is becoming critical. Graphene-based batteries and supercapacitors offer faster charging, longer lifespan, and higher energy density than conventional technologies, which is vital for fueling the country's EV ambitions and sustainable energy targets.

The partnership between Tivolt Electric Vehicles and Tata Power Renewable Energy Limited aims to build a strong ecosystem for EV charging solutions integrated with solar energy to reduce carbon footprint and electricity costs. This underlines that graphene-enabled energy applications directly support India's decarbonization and e-mobility

goals. With the Indian government pushing policies for renewable energy, energy efficiency, and sustainable transport, this sector is a prime growth area for graphene adoption. Rising investments in research and manufacturing capacity for graphene production enhance the scalability and commercial viability of graphene-based energy storage and electronics components. India's electronics manufacturing growth, combined with a focus on innovation in materials science, accelerates the developing and deployment of graphene-enhanced devices across consumer electronics, telecommunications, and industrial applications. This growing demand from multiple converging industries makes the electronics and energy storage sectors crucial drivers of the graphene market's rapid expansion.

Graphene's emergence as a material of choice for environmental solutions represents a significant and distinctive driver for its market growth in India. The country has long grappled with acute water scarcity and contamination challenges—according to NITI Aayog's Composite Water Management Index, over 600 million Indians face high to extreme water stress, and nearly 70% of surface water is contaminated. Graphene's atomic-scale filtration capabilities enable the design of next-generation membranes that can efficiently remove heavy metals, microbes, and chemical pollutants from water sources. Institutions such as the Indian Institute of Technology (IIT) Madras and the Indian Institute of Science (IISc) Bengaluru have demonstrated graphene-oxide membranes capable of desalination and high-throughput water purification, making them viable solutions for rural and urban India. Government initiatives like the Jal Jeevan Mission, targeting piped water supply to every rural household, further enhance the market potential for graphene-based water purification solutions—especially as policymakers embrace advanced, scalable, and low-cost technologies.

Graphene's application in sustainability-driven sectors is broadening rapidly. Its high strength and low weight offer significant promise for developing eco-friendly composites and coatings for infrastructure and consumer goods, reducing resource consumption and enhancing material lifespans. For example, graphene-infused paints and coatings can improve corrosion resistance and thermal management, reducing maintenance costs and energy use in buildings and industrial plants. These applications align with national efforts to cut emissions and promote sustainable practices across sectors.

Graphene's potential extends to air purification, soil remediation, and remediation of industrial effluents. Its high surface area and tunable surface chemistry allow it to capture or decompose hazardous pollutants—an area actively explored by research labs in partnership with local governments. As corporate environmental responsibility dives deeper within Indian industry, the uptake of advanced materials such as graphene will

likely scale up, opening new revenue streams and supporting national sustainability targets.

India's ambitious renewable energy targets, i.e., achieving 175 GW of renewable capacity by 2025, present a significant opportunity for the graphene market. Graphene's exceptional electrical conductivity, mechanical strength, and energy storage capabilities make it an ideal material for enhancing batteries, supercapacitors, and EV charging infrastructure. These improvements contribute to longer battery life, faster charging times, and higher energy density—critical factors for accelerating electric vehicle adoption and efficient renewable energy integration.

As the government continues to push policies supporting clean energy and sustainable transport, graphene-enabled materials can help lower carbon footprints and reduce overall operational costs in these sectors. This synergy between policy and technology underpins the graphene market's potential to thrive as India advances its clean energy ambitions.

Graphene nanocomposites represent a promising avenue for growth in India's manufacturing landscape. These materials combine graphene with polymers, metals, or ceramics to create composites with superior mechanical, thermal, and electrical properties. Graphene nanocomposites can deliver enhanced strength, lightweight characteristics, corrosion resistance, and better thermal management in aerospace, automotive, packaging, and building materials sectors. India's expanding industrial base, which includes rapidly growing automotive and aerospace manufacturing hubs, can capitalize on these superior composites to improve product performance and durability.

The adoption of graphene nanocomposites supports India's goal of moving toward high-tech manufacturing and exports of advanced materials. Several Indian startups and research institutes are working on innovative graphene composite formulations tailored for industrial uses, creating opportunities for scaling up production and commercialization. This opens new revenue streams beyond traditional electronic and energy storage applications, boosting the overall market growth potential.

Some of the key players operating in the India graphene market are Otto Chemie Pvt. Ltd., Techinstro, BT Corp, Carborundum Universal Ltd., LHP NanoTech LLP, Tata Steel Ltd., KNV'S Incorporation, Sonu Chem, AdNano Technologies Pvt Ltd., and Reinste Nano Ventures.

The overall India graphene market size has been derived using both primary and secondary sources. To begin the research process, exhaustive secondary research has been conducted using internal and external sources to obtain qualitative and quantitative information about the market. Also, multiple primary interviews have been conducted with industry participants to validate the data and gain analytical insights into the topic. Participants in this process include industry experts, such as VPs, business development managers, market intelligence managers, and national sales managers, along with external consultants, such as valuation experts, research analysts, and key opinion leaders, specializing in the India graphene market.

Contents

1. INTRODUCTION

- 1.1 Report Guidance
- 1.2 Market Segmentation

2. EXECUTIVE SUMMARY

- 2.1 Analyst Market Outlook
- 2.2 Market Attractiveness

3. RESEARCH METHODOLOGY

- 3.1 Secondary Research
- 3.2 Primary Research
 - 3.2.1 Hypothesis formulation:
 - 3.2.2 Macro-economic factor analysis:
 - 3.2.3 Developing base number:
 - 3.2.4 Data Triangulation:
 - 3.2.5 Country level data:
- 3.3 Assumptions and Limitations

4. INDIA GRAPHENE MARKET LANDSCAPE

- 4.1 Overview
- 4.2 Porter's Five Forces Analysis
 - 4.2.1 Threat of New Entrants:
 - 4.2.2 Threat of Substitutes:
 - 4.2.3 Bargaining Power of Buyers:
 - 4.2.4 Bargaining Power of Suppliers:
 - 4.2.5 Competitive Rivalry:
- 4.3 Ecosystem Analysis
 - 4.3.1 Raw Material Suppliers
 - 4.3.2 Distributors or Suppliers
 - 4.3.3 End-Use Industry:
 - 4.3.4 List of Vendors in the Supply Chain

5. INDIA GRAPHENE MARKET - KEY MARKET DYNAMICS

5.1 India Graphene Market - Key Market Dynamics

5.2 Market Drivers

5.2.1 Growing Demand from Electronics, Energy Storage, and Renewable Energy Sectors

5.2.2 Government Support and Research and Development Initiatives

5.2.3 Advancing Environmental Sustainability and Water Purification Technologies

5.3 Market Restraints

5.3.1 High Production Costs and Scalability Challenges

5.3.2 Environmental and Health Concerns Associated with Graphene

5.3.3 Market Fragmentation and Lack of Skilled Workforce

5.4 Market Opportunities

5.4.1 Growth in Renewable Energy and Electric Vehicle (EV) Ecosystems

5.4.2 Expansion in Graphene Nanocomposites for Advanced Manufacturing

5.4.3 Development of Graphene-Enabled Flexible and Wearable Electronics

5.5 Future Trends

5.5.1 Quantum Computing and Advanced Semiconductor Integration with Graphene

5.5.2 Smart Textiles and Wearable Technologies Powered by Graphene

5.5.3 Graphene-Enabled Photocatalysts and Environmental Remediation

Technologies

5.6 Impact of Drivers and Restraints:

6. INDIA GRAPHENE MARKET ANALYSIS

6.1 India Graphene Market Volume (Tons), 2021-2031

6.2 India Graphene Market Volume Forecast and Analysis (Tons)

6.3 India Graphene Market Revenue (US\$ Million), 2021-2031

6.4 India Graphene Market Forecast and Analysis

7. INDIA GRAPHENE MARKET VOLUME AND REVENUE ANALYSIS - BY APPLICATION

7.1 Composites

7.1.1 Overview

7.1.2 Composites: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

7.1.3 Composites: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

7.2 Concrete

7.2.1 Overview

- 7.2.2 Concrete: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
- 7.2.3 Concrete: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)
- 7.3 Battery Additives
 - 7.3.1 Overview
 - 7.3.2 Battery Additives: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
 - 7.3.3 Battery Additives: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)
- 7.4 Others
 - 7.4.1 Overview
 - 7.4.2 Others: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
 - 7.4.3 Others: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

8. INDIA GRAPHENE MARKET VOLUME AND REVENUE ANALYSIS - BY END-USE INDUSTRY

- 8.1 Electric Vehicles
 - 8.1.1 Overview
 - 8.1.2 Electric Vehicles: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
 - 8.1.3 Electric Vehicles: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)
- 8.2 Building and Construction
 - 8.2.1 Overview
 - 8.2.2 Building and Construction: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
 - 8.2.3 Building and Construction: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)
- 8.3 Paints and Coatings
 - 8.3.1 Overview
 - 8.3.2 Paints and Coatings: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)
 - 8.3.3 Paints and Coatings: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)
- 8.4 Aerospace and Defense
 - 8.4.1 Overview
 - 8.4.2 Aerospace and Defense: India Graphene Market - Volume and Forecast,

2021-2031 (Tons)

8.4.3 Aerospace and Defense: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

8.5 Others

8.5.1 Overview

8.5.2 Others: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

8.5.3 Others: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

9. INDIA GRAPHENE MARKET VOLUME AND REVENUE ANALYSIS - BY REGION

9.1 North

9.1.1 Overview

9.1.2 North: India Graphene Market - Volume and Forecast to 2031 (Tons)

9.1.3 North: India Graphene Market - Revenue and Forecast to 2031 (US\$ Million)

9.2 South

9.2.1 Overview

9.2.2 South: India Graphene Market - Volume and Forecast to 2031 (Tons)

9.2.3 South: India Graphene Market - Revenue and Forecast to 2031 (US\$ Million)

9.3 West

9.3.1 Overview

9.3.2 West: India Graphene Market - Volume and Forecast to 2031 (Tons)

9.3.3 West: India Graphene Market - Revenue and Forecast to 2031 (US\$ Million)

9.4 East

9.4.1 Overview

9.4.2 East: India Graphene Market - Volume and Forecast to 2031 (Tons)

9.4.3 East: India Graphene Market - Revenue and Forecast to 2031 (US\$ Million)

10. COMPETITIVE LANDSCAPE

10.1 Heat Map Analysis by Key Players

10.2 Company Market Share Analysis, 2024

11. INDIA GRAPHENE INDUSTRY LANDSCAPE

11.1 Overview

11.2 Expansions And Other Strategic Developments

11.3 Product News

12. COMPANY PROFILES

12.1 Otto Chemie Pvt. Ltd.

- 12.1.1 Key Facts
- 12.1.2 Business Description
- 12.1.3 Products and Services
- 12.1.4 Financial Overview
- 12.1.5 SWOT Analysis
- 12.1.6 Key Developments
- 12.1.7 Product Pricing

12.2 Techinstro

- 12.2.1 Key Facts
- 12.2.2 Business Description
- 12.2.3 Products and Services
- 12.2.4 Financial Overview
- 12.2.5 SWOT Analysis
- 12.2.6 Key Developments
- 12.2.7 Product Pricing

12.3 BT Corp

- 12.3.1 Key Facts
- 12.3.2 Business Description
- 12.3.3 Products and Services
- 12.3.4 Financial Overview
- 12.3.5 SWOT Analysis
- 12.3.6 Key Developments

12.4 Carborundum Universal Ltd

- 12.4.1 Key Facts
- 12.4.2 Business Description
- 12.4.3 Products and Services
- 12.4.4 Financial Overview
- 12.4.5 SWOT Analysis
- 12.4.6 Key Developments

12.5 LHP NanoTech LLP

- 12.5.1 Key Facts
- 12.5.2 Business Description
- 12.5.3 Products and Services
- 12.5.4 Financial Overview
- 12.5.5 SWOT Analysis
- 12.5.6 Key Developments

12.6 Tata Steel Ltd

12.6.1 Key Facts

12.6.2 Business Description

12.6.3 Products and Services

12.6.4 Financial Overview

12.6.5 SWOT Analysis

12.6.6 Key Developments

12.7 KNV'S Incorporation

12.7.1 Key Facts

12.7.2 Business Description

12.7.3 Products and Services

12.7.4 Financial Overview

12.7.5 SWOT Analysis

12.7.6 Key Developments

12.7.7 Product Pricing

12.8 Sonu Chem

12.8.1 Key Facts

12.8.2 Business Description

12.8.3 Products and Services

12.8.4 Financial Overview

12.8.5 SWOT Analysis

12.8.6 Key Developments

12.9 AdNano Technologies Pvt Ltd

12.9.1 Key Facts

12.9.2 Business Description

12.9.3 Products and Services

12.9.4 Financial Overview

12.9.5 SWOT Analysis

12.9.6 Key Developments

12.9.7 Product Pricing

12.10 Reinste Nano Ventures

12.10.1 Key Facts

12.10.2 Business Description

12.10.3 Products and Services

12.10.4 Financial Overview

12.10.5 SWOT Analysis

12.10.6 Key Developments

12.11 Platonic Nanotech

12.11.1 Key Facts

- 12.11.2 Business Description
- 12.11.3 Products and Services
- 12.11.4 Financial Overview
- 12.11.5 SWOT Analysis
- 12.11.6 Key Developments

13. APPENDIX

- 13.1 About The Insight Partners

List Of Tables

LIST OF TABLES

Table 1. India Graphene Market Segmentation

Table 2. List of Vendors

Table 3. India Graphene Market - Volume, 2021-2024 (Tons)

Table 4. India Graphene Market - Volume Forecast, 2025-2031 (Tons)

Table 5. India Graphene Market - Revenue, 2021-2024 (US\$ Million)

Table 6. India Graphene Market - Revenue Forecast, 2025-2031 (US\$ Million)

Table 7. India Graphene Market - Volume, 2021-2024 (Tons) - by Application

Table 8. India Graphene Market - Volume Forecast, 2025-2031 (Tons) - by Application

Table 9. India Graphene Market - Revenue, 2021-2024 (US\$ Million) - by Application

Table 10. India Graphene Market - Revenue Forecast, 2025-2031 (US\$ Million) - by Application

Table 11. India Graphene Market - Volume, 2021-2024 (Tons) - by End-use Industry

Table 12. India Graphene Market - Volume Forecast, 2025-2031 (Tons) - by End-use Industry

Table 13. India Graphene Market - Revenue, 2021-2024 (US\$ Million) - by End-use Industry

Table 14. India Graphene Market - Revenue Forecast, 2025-2031 (US\$ Million) - by End-use Industry

Table 15. India Graphene Market - Volume and Forecast to 2031 (Tons) - by Region

Table 16. India Graphene Market - Revenue and Forecast to 2031 (US\$ Million) - by Region

Table 17. Heat Map Analysis by Key Players

List Of Figures

LIST OF FIGURES

Figure 1. India Graphene Market Segmentation, by Region

Figure 2. Porter's Five Forces Analysis: India Graphene Market

Figure 3. Ecosystem: India Graphene Market

Figure 4. Impact Analysis of Drivers and Restraints

Figure 5. India Graphene Market Volume (Tons), 2021-2031

Figure 6. India Graphene Market Revenue (US\$ Million), 2021-2031

Figure 7. India Graphene Market Share (%) - Application, 2024 and 2031

Figure 8. Composites: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 9. Composites: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 10. Concrete: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 11. Concrete: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 12. Battery Additives: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 13. Battery Additives: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 14. Others: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 15. Others: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 16. India Graphene Market Share (%) - End-use Industry, 2024 and 2031

Figure 17. Electric Vehicles: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 18. Electric Vehicles: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 19. Building and Construction: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 20. Building and Construction: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 21. Paints and Coatings: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 22. Paints and Coatings: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 23. Aerospace and Defense: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 24. Aerospace and Defense: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 25. Others: India Graphene Market - Volume and Forecast, 2021-2031 (Tons)

Figure 26. Others: India Graphene Market - Revenue and Forecast, 2021-2031 (US\$ Million)

Figure 27. India Graphene Market Share (%) - Region, 2024 and 2031

Figure 28. North: India Graphene Market - Volume and Forecast to 2031(Tons)

Figure 29. North: India Graphene Market - Revenue and Forecast to2031 (US\$ Million)

Figure 30. South: India Graphene Market - Volume and Forecast to 2031(Tons)

Figure 31. South: India Graphene Market - Revenue and Forecast to2031 (US\$ Million)

Figure 32. West: India Graphene Market - Volume and Forecast to 2031(Tons)

Figure 33. West: India Graphene Market - Revenue and Forecast to2031 (US\$ Million)

Figure 34. East: India Graphene Market - Volume and Forecast to 2031(Tons)

Figure 35. East: India Graphene Market - Revenue and Forecast to2031 (US\$ Million)

Figure 36. Company Market Share Analysis, 2024

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