

1,3-Propanediol (PDO) Market Size Analysis Report - Market Share, Forecast Trends and Outlook (2025-2034)

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Report description:

The global 1,3-propanediol (PDO) market attained a value of above USD 492.00 Million in 2024. The market is further expected to grow in the forecast period of 2025-2034 at a CAGR of 7.20% to reach more than USD 986.08 Million by 2034.

The global market for 1,3-propanediol (PDO) is being driven by the rising applications of chemical in the engineering plastics and textile dyeing and finishing industries. The growing applications of engineered plastics in the automotive, building and construction, consumer goods and appliances, and electrical and electronics industries owing to the rapid urbanisation and technological advancements are likely to propel the demand of 1,3-propanediol (PDO) market in the forecast period. Further, the thriving textile dyeing and finishing industry owing to the rising disposable income and rapid economic growth, especially in developing countries, is likely to provide impetus to the 1,3-propanediol (PDO) industry in the coming years.

1,3-Propanediol (PDO) Market Trends

Bio-based PDO, produced from renewable resources like corn sugar, is gaining traction as industries seek eco-friendly alternatives to petroleum-based products. This shift is particularly evident in the textiles, cosmetics, and automotive sectors, where PDO's use in biodegradable polymers like polytrimethylene terephthalate (PTT) is popular for making stretchable, durable fabrics and automotive interiors.

A crucial trend of 1,3-propanediol (PDO) market is that the advances in biotechnology and fermentation processes have significantly improved the efficiency and cost-effectiveness of PDO production. Innovations such as genetically engineered microorganisms allow for high-purity PDO production with lower greenhouse gas emissions.

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Recent Developments

As per the 1,3-Propanediol (PDO) market dynamics and trends, 1,3-Propanediol (PDO) is an important compound for developing advanced polymers, such as polytrimethyleneterephthalate (PTT). Recently, the shift from chemical production methods to biological processes for PDO has positioned it as a key green chemical sourced from renewable materials.

Industry Outlook

CovationBio PDO, the largest global producer of 100% plant-based 1,3-propanediol, announced a 33,000-ton production expansion to meet the rising demand for its bio-based products. As per the 1,3-propanediol (PDO) industry analysis, CovationBio's Susterra PDO and Zemea PDO are increasingly used in automotive, footwear, and personal care sectors, leveraging their low environmental impact. This bio-based PDO is replacing petroleum-derived glycols in high-performance applications, supporting a range of consumer brands committed to sustainability initiatives.

The pharmaceutical sector in India is currently valued at USD 50 billion. India is a key player in pharmaceutical exports, serving over 200 countries. The country meets more than 50% of Africa's demand for generic medicines, around 40% of the generic market in the United States, and about 25% of the total pharmaceutical supply in the United Kingdom, which is expected to contribute to the growth of the 1,3-propanediol (PDO) industry, which can be used as a basis or as a solvent for advanced syntheses. Additionally, India accounts for approximately 60% of the global vaccine demand and is a major supplier of DPT, BCG, and measles vaccines. Roughly 70% of the vaccines included in the World Health Organisation's essential immunisation schedule are sourced from India.

As part of the Production-Linked Incentive (PLI) scheme for bulk drugs, the goal is to boost the domestic production of 41 critical bulk drugs in India. A total of 51 projects have been approved for 34 identified bulk drugs, with 22 projects already commissioned as of January 31, 2023. An investment of INR 2,019 crore has been reported, leading to the creation of 1,900 jobs during this period, which can further contribute to the 1,3-propanediol (PDO) industry revenue.

Diverse applications of 1,3-Propanediol (PDO) and growing demand for bio-based PDO is supporting the market growth.

- 1,3-Propanediol (PDO) is used in a wide range of industries, including cosmetics, personal care, textiles, and polymers, contributing to a broad market base and steady demand.
- Bio-based PDO, derived from renewable resources like corn, is gaining popularity due to its eco-friendly properties, aligning with the growing trend toward sustainability in various sectors, which also boosts the growth of the 1,3-propanediol (PDO) market.
- PDO offers enhanced performance in applications like polyester production, providing higher durability, elasticity, and softness, making it a preferred choice in textiles and plastics manufacturing.

High production costs and limited raw material availability may hinder its adoption.

- The production cost of bio-based PDO remains relatively high compared to petrochemical-based alternatives, which can limit its adoption.
- Limited availability of raw materials, such as corn sugar, can constrain the production capacity of PDO as well as affect the 1,3-propanediol (PDO) demand forecast.
- The complex fermentation and purification processes require significant investment in specialized equipment and technology.
- While PDO offers several benefits, awareness of its advantages over traditional alternatives remains limited, especially in emerging markets, which can slow its adoption.
- Regulatory hurdles and compliance with quality standards in different regions can pose challenges for market expansion.

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Expanding applications and growing demand for sustainable products present growth opportunities

- The increasing application of PDO in personal care and cosmetic products, due to its moisturizing and skin-friendly properties, offers significant growth opportunities.
- The use of PDO in the production of polytrimethylene terephthalate (PTT) for textiles and carpets is expanding, driving 1,3-propanediol (PDO) demand.
- Growing consumer preference for sustainable and biodegradable products is creating new market opportunities for bio-based PDO.
- Collaborations and partnerships with research institutions and chemical companies can lead to innovative product developments and market expansion.
- The increasing focus on reducing carbon footprints and environmental impact is likely to drive the demand for bio-based PDO.

Key Competitive Factors in the Global 1,3-Propanediol (PDO) Market

Product Differentiation and Innovation:

- **Sustainable Production:** Companies differentiate their products by emphasizing the use of renewable resources and environmentally friendly production processes. Bio-based PDO is particularly appealing to eco-conscious consumers and industries.
- **Advanced Technologies:** Leveraging advanced fermentation and chemical synthesis technologies to enhance the purity, performance, and cost-efficiency of PDO products can boost 1,3-propanediol (PDO) demand growth.
- **Customization:** Offering tailored solutions to meet specific industry requirements and applications, such as in cosmetics, pharmaceuticals, and textiles.

Pricing and Cost Management:

- **Competitive Pricing:** Companies adopt competitive pricing strategies to cater to different market segments, balancing between cost-efficiency and maintaining profit margins.
- **Cost Optimization:** Efficient manufacturing processes, economies of scale, and strategic sourcing of raw materials help in reducing production costs, enhancing profitability as well as 1,3-propanediol (PDO) market opportunities.

Distribution and Market Reach:

- **Global Presence:** Leading players ensure their PDO products are available through a global network of distributors, retailers, and direct sales channels.
- **Local Partnerships:** Forming strategic partnerships with local distributors and manufacturers to enhance market reach and customer accessibility.

1,3-Propanediol (PDO) Industry Segmentation

1,3-Propanediol (PDO) is defined as a type of 3-carbon diol that is a colourless viscous liquid and has excellent solubility in water. With a boiling point of 213 C and molar mass of 76.09 g/mol, the compound has a molecular formula C₃H₈O₂. It finds applications in the chemical synthesis of various compounds such as polyurethanes, polyether, and polyesters, among others.

Market Breakup by Source

- Bio-based PDO

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- Petrochemical-based PDO

Market Breakup by Application

- Polyurethane
- Personal Care Products
- Polytrimethylene Terephthalate
- Others

Market Breakup by End-User Industry

- Synthetic Drugs
- Engineering Plastics
- Textile Dyeing and Finishing
- Others

Market Breakup by Region

- North America
- Europe
- Asia Pacific
- Latin America
- Middle East and Africa

1,3-Propanediol (PDO) Market Share

Based on the source, the bio-based PDO segment accounts for a significant 1,3-propanediol (PDO) market share and is expected to grow at a CAGR of 9.0% in the forecast period owing to the stringent government regulations regarding the use of chemically hazardous products. With increasing interest in the utilisation of sustainable energy resources, the use of PDO in the production of biodiesel is likely to augment the market growth. Moreover, the increasing focus on reducing the dependency on petroleum products owing to the rising concerns regarding the depletion of fossil fuels is anticipated to propel the growth of the segment in the forecast period.

1,3-Propanediol (PDO) Market Regional Insights

The market in North America is being driven by the increasing consumption of 1,3-propanediol (PDO) owing to the growing expansion of various end-use industries in the region. USA and Canada's markets are expected to grow at CAGRs of 7.3% and 8.4% between 2025 and 2034, which can enhance 1,3-propanediol (PDO) market value. The increasing expansion of major PDO manufacturers in the United States and Canada is anticipated to bolster the market. Furthermore, the introduction of various government regulations encouraging the production of biodiesel is likely to be a major aiding factor of the market for 1,3-propanediol (PDO) in the region, which is predicted to significantly contribute to the growth of the overall market in the forecast period.

Competitive Landscape

The report gives a detailed analysis of the following key players in the global 1,3-propanediol (PDO) market, covering their competitive landscape, capacity, and latest developments like mergers, acquisitions, and investments, expansions of capacity,

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and plant turnarounds:

DuPont Tate & Lyle Bio Products_x000D_
Tokyo Chemical Industry Co. Ltd_x000D_
Haihang Industry Co., Ltd._x000D_
Sheng Hong Group Holdings Ltd_x000D_
Merck KGaA_x000D_
Others

Key Competitors and their Strategies:

DuPont Tate & Lyle Bio Products Company, LLC:

- DuPont Tate & Lyle is a leading player in the 1,3-propanediol (PDO) market, known for its Bio-PDO product derived from renewable resources.
- The company focuses on sustainability and innovation, highlighting the eco-friendly nature of its bio-based PDO. It emphasizes partnerships and collaborations to expand its market reach and application areas.

Tokyo Chemical Industry Co. Ltd.:

- Tokyo Chemical Industry (TCI) is a significant player in the PDO market, offering a wide range of chemical products.
- TCI focuses on high-purity and specialty chemicals, catering to the needs of the research and industrial sectors. The company leverages its strong R&D capabilities to innovate and expand its product portfolio, which can contribute to 1,3-propanediol (PDO) market revenue.

Haihang Industry Co., Ltd.:

- Haihang Industry is a key player providing a wide range of chemical products, including PDO.
- Haihang Industry focuses on product diversification and offering comprehensive solutions to its clients. The company also invests in expanding its global distribution network and enhancing customer service.

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