

1,4-Butanediol Market Assessment, By Derivative [Tetrahydrofuran, Polybutylene Terephthalate, Gamma-Butyrolactone, Polyurethane, Others], By Type [Synthetic, Bio-Based], By Region, Opportunities and Forecast, 2018-2032F

Market Report | 2025-06-16 | 220 pages | Market Xcel - Markets and Data

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Report description:

Global 1,4-butanediol market is expected to grow at a CAGR of 6.07% during the forecast period 2025-2032, growing from USD 8.83 billion in 2024 to USD 14.15 billion in 2032. The 1,4-butanediol industry has been finding its growth base because of its diversified applications in various applications.

Major drivers for this industry are an increasing need from the automobile industry for high-performance plastics, the surge in usage of spandex fibers by the textiles industry, and the growing use as a chemical intermediate by the pharmaceutical industry. Further, a growing focus on sustainability is driving the production of bio-based 1,4-butanediol. For instance, in September 2023, BASF announced the acquisition of long-term access to QIRA bio-based 1,4-butanediol from Qore LLC, a joint venture between Cargill Inc. and HELM AG. Qore LLC produces the bio-based 1,4-butanediol at Cargill Inc.'s biotechnology campus and corn refining operation in Eddyville, Iowa. BASF will expand its 1,4-butanediol derivatives with bio-based variants of polytetramethylene ether glycol and tetrahydrofuran. The first commercial quantities are expected to be available in 2025. QIRA is made through fermentation of plant-based sugars from field corn, potentially reducing the product's carbon footprint by up to 86% compared to fossil-based 1,4-butanediol.

Moreover, rising demand for polybutylene terephthalate and tetrahydrofuran in various end-user markets, drives the 1,4-butanediol market globally. Polybutylene terephthalate, a raw material mainly used in spandex fibers, is produced by tetrahydrofuran feedstock. Demand in the textile industry is increasing for spandex fibers due to the rising production of lightweight and fuel-efficient vehicles, while demand for polybutylene terephthalate (PBT), which uses 1,4-butanediol, is also growing.

Rising Polybutylene Terephthalate Demand from Various Industries Drives 1,4-butanediol Market

The growing need for polybutylene terephthalate across several sectors drives the 1,4-butanediol market. Polybutylene terephthalate is highly prized for its exceptional mechanical strength, chemical resistance, and thermal stability, which makes it

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an excellent material for use in the electronics, electrical, and automotive industries. In the automotive industry, polybutylene terephthalate plays a significant role in vehicle performance as an energy absorber and weight reducer in components such as bumpers and interior parts. Its lightweight contributes to improved fuel efficiency, reflecting the move toward more environmentally friendly practices in the sector, propelling the global 1,4-butanediol market.

Within the electrical and electronics sector, polybutylene terephthalate is preferred due to its superior insulation capabilities and resistance to wear and environmental conditions. It is widely applied in the production of connectors, housings, and other key components that necessitate reliability and longevity. Increased focus on the use of lightweight materials in these industries further drives demand for polybutylene terephthalate, as producers improve product performance while decreasing overall weight. As industries grow and evolve, the demand for polybutylene terephthalate is expected to increase, fueling continued growth in the 1,4-butanediol market as a critical precursor in its production.

For instance, in June 2023, Johnson Matthey Plc, a sustainable technologies provider, provided Fujian Zhongjing Petrochemical Group with the latest 1,4-butanediol technology to produce bio-degradable plastics. The three separate 1,4-butanediol plants are under construction in phases. Fujian Zhongjing Petrochemical Group, one of the largest private petrochemical enterprises in Fujian Province, is expected to produce 600,000 metric tons of bio-degradable plastics per year using Johnson Matthey's technology. These biodegradable plastics are used in compostable packaging, and they decompose due to microorganisms like fungi and bacteria.

Rising Emphasis on Bio-Based 1,4-Butanediol for Spandex Fibers Manufacturing

The 1,4-Butanediol (BDO) market is transitioning toward bio-based alternatives, particularly for spandex fiber production. This comes from increased attention globally on being more sustainable and reducing carbon footprint. Bio-based 1,4-butanediol from renewable resources such as sugars and cellulosic feedstocks are environmentally friendlier than traditional petroleum-based 1,4-butanediol. In addition, bio-based 1,4-butanediol has biodegradability, high durability, stability, moisture resistance, and excellent insulating properties. Companies also have pressure on the environment and to reduce their carbon footprint. Bio-based 1,4-butanediol significantly reduces greenhouse gas emissions compared to fossil-based 1,4-butanediol. Bio-based 1,4-butanediol production uses the novel route of catalytic hydrogenation or bioconversion of sugars, succinic acid, and furfural. Owing to these reasons, BASF is successfully ensuring long-term access to these bio-based 1,4-butanediol products to further expand its portfolio of bio-based 1,4-butanediol derivatives. This change to bio-based 1,4-butanediol thereby aligns with the aspect of being environmentally friendly while offering sustainable and transparent supply chains.

For instance, in March 2024, Hyosung TNC received investment approval for the Hyosung butanediol project from the Ba Ria-Vung Tau provincial government in Vietnam. The company plans to invest USD 1 billion to establish multiple bio-based 1,4-butanediol production plants capable of producing 200,000 tons annually. The project aims to attract significant attention in the sustainable materials market. Genomatica, Inc.'s proven technology will enable Hyosung TNC to fast track their project and unlock 50,000 tons of Bio-based 1,4-butanediol production and selling in the first half of 2026.

Synthetic 1,4-Butanediol Holds the Largest Market Share

The demand for synthetic 1,4-butanediol (BDO) exists in the market primarily due to its critical role as a key intermediate in the production of high-demand chemicals such as tetrahydrofuran, polybutylene terephthalate, and polyurethane. Developing countries are investing heavily in chemical production, which drives the demand for synthetic 1,4-butanediol in the market. Synthetic 1,4-butanediol, predominantly produced through established petrochemical processes due to which product remains the preferred choice for manufacturers in the chemical industry. The synthetic 1,4-butanediol can meet the scalability and cost-effectiveness which are required by industrial operations, thereby driving its demand in the market. Industries are demanding durable and high-performance raw materials to produce chemicals and versatile applications, which drive their demand in the market. Additionally, ongoing innovation in end-use applications and the expansion of manufacturing facilities for downstream products continue to drive synthetic 1,4-butanediol demand in the forecast period.

Asia-Pacific Dominates the Global Market

The demand for 1,4-butanediol is rising rapidly in the Asia-Pacific region due to robust industrial growth and expanding end-use industries. Several developing countries such as China and India, which are highly investing in the automotive, textiles, electronics, and pharmaceutical sectors, are propelling the Asia-Pacific 1,4-butanediol market demand. The 1,4-butanediol and its derivatives are widely used in the production of different raw materials, which are used in different sectors. 1,4-butanediol is in

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high demand in the region to produce lightweight components, energy absorption, and safety devices for the automotive sector. For instance, in July 2024, as per the Automotive Component Manufacturers Association of India (ACMA), the auto component makers in India are expected to invest USD 2.5-3 billion during the financial year 2025. With the rise in investment in the automotive component sector, the demand for 1,4-butanediol is expected to increase in the forecast period. Further, the Asia-Pacific has a strong chemical manufacturing base, and the presence of major industry players ensures a steady supply and innovation in 1,4-butanediol applications. Furthermore, the Asia-Pacific has benefits related to cost, affordable labor, and other raw materials, which are used to manufacture more competitive products and support large-scale production of 1,4-butanediol across the Asian countries. In conclusion, the ongoing industrialization, urbanization, and increasing demand for high-performance materials across multiple sectors are driving the demand for 1,4-butanediol in the region.

Impact of the United States Tariffs on Global 1,4-Butanediol Market

□ Tariffs on imported 1,4-butanediol and its derivatives, especially from countries like China, have raised the cost of imports for the manufacturers located in the United States, leading to higher operational expenses and squeezing profit margins.

□ Supply chain disruptions and compliance hurdles are expected to cause delays and impacting the production of 1,4-butanediol based products in the current situation.

□ The rise in tariffs leads to the slowdown of innovation and product adoption, leading to market uncertainty, thus impacting market growth.

□ Key downstream sectors like automotive, construction, and electronics are experiencing increased costs and potential production delays, leading to market uncertainty.

Key Players Landscape and Outlook

The global 1,4-butanediol market is concentrated, with major global chemical enterprises having large-scale manufacturing networks with high technological capabilities. These large enterprises maintain their leadership position owing to integrated chain value, vast distribution and marketing networks, along with huge production capacity in major regions. Market does highlight a differentiation in global players playing across the borders of diverse markets with broader products and regional specialists focusing either on specific geography-based markets or an application. Major mergers and acquisitions have indeed been seen in recent times, albeit this is significantly focused on gaining geographical presence and attaining technological capacities.

Companies are increasingly looking for strategic partnerships and joint ventures, especially in emerging markets, to strengthen their market position and access new customer bases.

For instance, in September 2023, BASF SE obtained long-term access to QIRA bio-based 1,4-butanediol from Qore LLC (Qore). BASF SE and Qore LLC agreed to the production of bio-based 1,4-butanediol at Cargill Inc.'s biotechnology campus and corn refining operation in Eddyville, Iowa. Furthermore, BASF SE expanded its portfolio with bio-based 1,4-butanediol derivatives, including polytetrahydrofuran and tetrahydrofuran. This development helps the company to increase its revenue in the coming years.

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