

Biogas Plant Market Size & Share Analysis - Growth Trends and Forecast (2025 - 2030)

Industry: Hydrogen & Clean Fuels

URL: <https://www.mordorintelligence.com/industry-reports/biogas-plant-market>

Biogas Plant Market Size and ShareMarket Overview

Study Period | 2020 - 2030 |

Forecast Data Period | 2025 - 2030 |

Historical Data Period | 2020 - 2023 |

Growth Rate | 3.15 % |

Fastest Growing Market | Asia-Pacific |

Largest Market | Europe |

Market Concentration | Low |

Major Players*Disclaimer: Major Players sorted in no particular order

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Biogas Plant Market Analysis by Mordor IntelligenceThe Biogas Plant Market is expected to register a CAGR of 3.15% during the forecast period.

The biogas industry is experiencing significant transformation driven by technological innovations and an increasing focus on sustainable energy solutions. Advanced biogas technology such as Dendro Liquid Energy (DLE), Home Biogas, and BioBong are revolutionizing biogas production methods, attracting new market players and improving operational efficiencies. The integration of smart monitoring systems and automation in biogas plants has enhanced process control and optimization, leading to improved yield and reduced operational costs. These technological advancements are particularly evident in Europe, which maintains its position as the largest biogas producer globally with approximately 20,000 biogas plants.

The industry is witnessing substantial investment flows and strategic initiatives across regions. China has announced plans to invest CNY 1.2 trillion (USD 183.6 billion) in the biomass and biogas sector from 2021 to 2025, demonstrating a strong commitment to renewable energy development. This investment is expected to enable the handling of about 350 million tons of organic waste and significantly boost clean energy production. In Europe, various funding programs and grants are supporting market growth, including the European Union's EUR 11 million grant for the Bio2Bunker Project, which aims to develop and expand sustainable biofuel supply chains.

Significant technological breakthroughs and innovative projects are reshaping the industry landscape. In Finland, Gasum opened the country's first liquefied biogas plant in Turku, capable of processing around 130,000 tonnes of biomass annually to produce approximately 60 GWh of liquefied biogas. This development represents a major milestone in scaling up biogas production and demonstrates the industry's capability to handle large-scale operations. Similarly, breakthrough projects like Serbia's new biogas plant in Vrbas, with an investment of EUR 9 million and electricity production capacity of 2.4 MW/hr, showcase the industry's growing sophistication.

The market is experiencing a shift towards integrated waste management solutions and circular economy principles. Biogas plants are increasingly being designed to handle multiple waste streams, from agricultural residues to municipal solid waste, contributing to both energy generation and waste management solutions. This integration is particularly evident in emerging markets where biogas plants serve dual purposes of waste management and energy generation. The industry is al

so witnessing increased collaboration between technology providers, waste management companies, and energy utilities to develop more efficient and sustainable biogas solutions, creating a more robust and interconnected market ecosystem.

Global Biogas Plant Market Trends and Insights

Growing Environmental Concerns and Renewable Energy Targets

Biogas plants play a crucial role in achieving global environmental objectives and advancing climate goals, as highlighted by their significant contribution to the UN Sustainable Development Goals and Paris Agreement implementation. According to the World Biogas Association (WBA), biogas technology has the potential to reduce global greenhouse gas emissions by 10-13% through the efficient processing of food waste, industrial production wastes, agricultural feedstocks, and sewage. This substantial reduction potential has made biogas plants an increasingly attractive solution for countries and organizations looking to meet their carbon reduction targets while simultaneously addressing waste management challenges.

The environmental benefits of biogas plants extend beyond emissions reduction to include the optimization of natural resource utilization and the promotion of circular economy principles. These facilities effectively transform organic waste streams into valuable renewable energy and bio-fertilizers, creating a closed-loop system that minimizes environmental impact. The International Energy Agency (IEA) has been actively collaborating with various partnerships, including the BioFuture Platform and the IEA Bioenergy Technology Collaboration Program, to accelerate the development of sustainable bioeconomy solutions globally. This collaborative approach has led to increased investment in biogas infrastructure and technology development, further cementing its position as a key contributor to environmental sustainability.

Understand The Key Trends Shaping This Market

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Government Support and Policy Initiatives

Governments worldwide have implemented comprehensive support mechanisms to accelerate biogas plant deployment, including financial incentives, subsidies, and favorable regulatory frameworks. For instance, the Central Financial Assistance (CFA) program provides substantial capital subsidies for different categories of biogas projects, offering up to INR 10 crore per project for various applications, including biogas generation, BioCNG production, and power generation. These support mechanisms have been instrumental in reducing initial investment barriers and improving the economic viability of biogas projects across different scales.

The policy landscape for biogas plants has evolved to include more sophisticated support mechanisms that address both supply and demand aspects of the market. Feed-in tariffs, renewable energy certificates, and investment grants have been complemented by mandatory renewable energy targets and waste management regulations that create a stable demand for biogas solutions. For example, the European Union's comprehensive policy framework includes specific targets for biomethane production and integration into the natural gas grid, supported by various financial instruments and regulatory measures. These coordinated policy efforts have created a favorable environment for biogas plant development and operation, encouraging both private and public sector participation in the market.

Waste Management and Agricultural Benefits

Biogas plants offer a sustainable solution to the growing challenge of organic waste management while providing significant benefits to the agricultural sector. These facilities can process various types of organic waste, including agricultural residues, food waste, and animal manure, converting them into valuable energy resources and high-quality organic fertilizers. The ability to handle multiple waste streams makes biogas plants particularly attractive for integrated waste

management strategies, helping communities and industries reduce their environmental footprint while generating renewable energy.

The agricultural benefits of biogas plants extend beyond waste management to include the production of nutrient-rich digestate that can replace chemical fertilizers. This dual benefit of waste treatment and fertilizer production creates a sustainable cycle that supports agricultural productivity while reducing environmental impact. For instance, biogas plants can process about 100 tons of sugar substances to produce approximately 450 kWh of energy per year while simultaneously generating valuable fertilizer products. This integration of waste management and agricultural benefits has made biogas plants an increasingly popular choice for farming communities and agricultural industries seeking sustainable solutions for their waste management and energy needs.

Energy Security and Grid Independence

Biogas plants contribute significantly to energy security by providing a reliable, locally-sourced renewable energy option that reduces dependence on imported fossil fuels. These facilities can operate continuously, providing baseload power generation capability that complements other renewable energy sources such as solar and wind. The ability to store biogas and generate electricity on-demand makes these plants particularly valuable for grid stability and energy security, especially in rural and remote areas where grid connectivity may be limited or unreliable.

The role of biogas plants in promoting grid independence is particularly evident in their application for combined heat and power (CHP) generation, which maximizes energy efficiency and utility. These facilities can achieve high overall efficiency rates by utilizing both the electrical and thermal energy produced, making them ideal for industrial applications and district heating systems. For example, modern biogas CHP plants can achieve total efficiency rates exceeding 90% when both electricity and heat are utilized, demonstrating their potential for efficient energy generation and distribution. This high efficiency, combined with the ability to operate independently of traditional grid infrastructure, makes biogas plants an important component of energy security strategies at both local and national levels.

Segment Analysis Electricity Generation Segment in Biogas Plant Market

Electricity generation continues to dominate the global biogas plant market in 2024, representing the largest application segment. The segment's prominence is driven by the increasing global electricity demand due to rising population, industrialization, and urbanization levels. Combined Heat and Power (CHP) engines are widely implemented for electricity generation from biogas power plant, with integrated heat recovery systems maximizing efficiency. The segment's growth is particularly strong in developing regions like Asia-Pacific and South America, where several countries are developing strategies to increase the biogas plant's role in their electricity generation mix. Major economies like China, India, and European nations are actively expanding their biogas-based power generation capacity through supportive government policies and financial incentives, further cementing the segment's market leadership.

Biofuel Segment in Biogas Plant Market

The biofuel segment is emerging as the fastest-growing application in the biogas plant market for the period 2024-2029. This rapid growth is primarily driven by the increasing adoption of compressed biomethane (CBG) as a renewable alternative to compressed natural gas (CNG), particularly in the transportation sector. The segment's expansion is supported by technological advancements in biogas upgrading system processes, which involve the removal of water, carbon dioxide, hydr

ogen sulfide, and other trace elements to produce high-quality renewable natural gas (RNG). The growing focus on reducing greenhouse gas emissions in the transportation sector, coupled with government mandates for renewable fuel adoption, is accelerating the segment's growth. Additionally, the development of liquefied biomethane (LBG) for heavier transport modes and ship bunkering is opening new growth avenues.

Remaining Segments in Biogas Plant Market Applications

The heat generation segment represents another significant application in the biogas plant market, offering a straightforward and efficient use of biogas digester for thermal energy production. This segment primarily serves basic cooking and water heating functionalities, particularly in areas with limited access to conventional fuels. The segment's impact is especially notable in process industries, such as chemical plants, oil refineries, and pulp and paper mills, which require substantial amounts of process heat for operations. The heat generation segment also benefits from the growing adoption of district heating applications and the increasing focus on maximizing energy efficiency through combined heat and power (CHP) systems in industrial and commercial settings.

Segment Analysis: Biogas Plant TypeMedium to Large-scale Digesters Segment in Biogas Plant Market

Medium to large-scale biogas digester continue to dominate the global biogas plant market, holding approximately 75% market share in 2024. These digesters are predominantly found in developed and industrialized economies, particularly in Europe and North America, where large-scale waste management and energy production facilities are well-established. The segment's dominance can be attributed to several factors, including higher energy output capacity, better economies of scale, and increased efficiency in processing large volumes of feedstock. These facilities are particularly prevalent in industrial applications, municipal waste treatment, and large agricultural operations where they can effectively process substantial quantities of organic waste, agricultural residues, and other biodegradable materials. The segment's strong market position is further reinforced by significant investments from both public and private sectors, especially in regions with supportive regulatory frameworks and incentives for renewable energy production.

Image © Mordor Intelligence. Reuse requires attribution under CC BY 4.0.Small-scale Digesters Segment in Biogas Plant Market

Small-scale biogas digester are emerging as the fastest-growing segment in the biogas plant market during the forecast period 2024-2029. This rapid growth is primarily driven by increasing adoption in developing regions such as Asia-Pacific, Africa, and the Middle East, where decentralized energy solutions are gaining prominence. The segment's growth is fueled by rising demand for clean energy sources in remote areas, particularly for power generation, heat generation, and transportation sectors. Small-scale digesters offer numerous advantages including lower initial investment requirements, easier maintenance, and suitability for rural and agricultural applications. These systems are particularly attractive for small farming communities and rural households, providing a sustainable solution for both waste management and energy generation. The segment's expansion is further supported by government initiatives promoting rural development and clean energy adoption, along with increasing awareness about the benefits of biogas reactor technology at the community level.

Geography AnalysisBiogas Plant Market in North America

North America represents a significant portion of the global biogas plant market, holding approximately 12% of the global market share in 2024. The region's market is primarily driven by stringent environmental regulations and an increasing focus on renewable energy sources. The United States leads the regional market with over 2,200 biogas facilities, including anaerobic digestion plants on farms, water resource recovery facilities, and landfill gas projects. The market benefits from strong government support through various incentive programs and renewable portfolio standards. Agricultural waste, particularly from livestock farms, serves as a major feedstock source for biogas plant production in the region. The market also sees significant contributions from municipal solid waste treatment facilities and water resource recovery plants. Canada complements the regional market with its extensive biomass resources from forest and agricultural industries, while Mexico shows potential for growth through energy reform initiatives.

Image © Mordor Intelligence. Reuse requires attribution under CC BY 4.0. Biogas Plant Market in Asia-Pacific

The Asia-Pacific biogas plant market has demonstrated robust growth, recording an impressive compound annual growth rate of approximately 7% between 2019 and 2024. The region's market is characterized by rapid industrialization and urbanization, particularly in countries like China and India. China leads the regional market with significant investments in biogas plant infrastructure and technology development, supported by national policies promoting renewable energy adoption. India's market is driven by government initiatives to promote rural energy security and waste management solutions. The region benefits from abundant agricultural waste resources and an increasing focus on sustainable waste management practices. Japan and South Korea contribute to market growth through technological innovations and strict environmental regulations. Southeast Asian countries, particularly Thailand and Indonesia, are emerging as promising markets due to their agricultural-based economies and supportive government policies for renewable energy development.

Biogas Plant Market in Europe

Europe continues to maintain its position as the global leader in the biogas plant market, with projections indicating a steady growth rate of approximately 3% annually from 2024 to 2029. The region's market is characterized by advanced technology adoption and a strong regulatory framework supporting renewable energy development. Germany leads the European market with the highest number of operational biogas plants, followed by Italy and France. The market benefits from the European Union's ambitious climate goals and circular economy initiatives. The region demonstrates particular strength in biomethane production and grid injection capabilities. Nordic countries show increasing adoption of biogas plant in the transportation sector, while Eastern European nations are gradually expanding their biogas plant infrastructure. The market is supported by well-established supply chains, experienced operators, and continuous technological innovations. The region's focus on reducing dependency on fossil fuels and achieving carbon neutrality continues to drive market growth.

Biogas Plant Market in South America

The South American biogas plant market demonstrates significant potential for growth, driven primarily by the region's vast agricultural resources and increasing focus on sustainable energy solutions. Brazil leads the regional market with its well-established sugarcane industry and a growing number of agricultural biogas plant projects. The region benefits from abundant feedstock availability, including agricultural residues, livestock waste, and municipal solid waste. Countries like Argentina and Colombia are gradually developing their biogas plant infrastructure, supported by renewable energy policies and environmental regulations. The market shows particular promise in the agricultural sector, where agricultural biogas plants offer dual benefits of waste management and energy generation.

. The region's focus on reducing greenhouse gas emissions and promoting circular economy principles continues to drive market development.

Biogas Plant Market in Middle East & Africa

The Middle East and Africa biogas plant market represents an emerging opportunity with significant untapped potential. The region's market is driven by increasing awareness of renewable energy benefits and growing waste management challenges in urban areas. South Africa leads the regional market with its established renewable energy framework and a growing number of agricultural biogas plant projects. Countries in the Middle East are gradually recognizing biogas plant as a viable solution for waste management and energy generation, particularly in the context of municipal solid waste treatment. The African continent shows promising potential due to its vast agricultural resources and increasing focus on rural electrification. The market benefits from international cooperation and technology transfer initiatives. Growing urbanization and the need for sustainable waste management solutions continue to drive market development in the region.

Competitive LandscapeTop Companies in Biogas Plant Market

The biogas plant market features prominent players like Engie SA, Air Liquide SA, Scandinavian Biogas, Gasum Oy, Ameresco, A2A SpA, and AB Holding SpA leading the industry through continuous innovation and strategic expansion. These biogas plant companies are actively investing in research and development to enhance biogas technology production efficiency and develop advanced upgrading technologies for biomethane generation. The industry witnesses a strong focus on building integrated value chains through strategic partnerships and acquisitions, particularly in emerging markets. Companies are increasingly adopting modular and scalable plant designs to serve diverse customer segments while expanding their geographical footprint through joint ventures and collaborations. The market leaders are also emphasizing sustainable practices and circular economy principles in their operations, incorporating advanced digital solutions and automation technologies to optimize plant performance and reduce operational costs.

Dynamic Market Structure Drives Industry Evolution

The biogas plant market exhibits a moderately fragmented structure with a mix of global conglomerates and specialized regional players competing across different market segments. Large multinational corporations leverage their extensive resources and technological capabilities to maintain market leadership, while specialized regional players focus on niche applications and local market expertise. The industry has witnessed significant consolidation through mergers and acquisitions, particularly in mature markets like Europe, where companies seek to strengthen their market position and expand their technological capabilities. The market demonstrates a clear trend towards vertical integration, with companies expanding across the value chain from plant construction to operation and maintenance services.

The competitive dynamics are characterized by increasing collaboration between technology providers, project developers, and end-users to create more efficient and sustainable biogas solutions. Market participants are actively pursuing strategic partnerships to combine complementary capabilities and address the growing demand for renewable energy solutions. The industry structure is evolving with the entry of new players, particularly in emerging markets, bringing innovative business models and technologies to the sector. Regional players are increasingly forming alliances with global technology providers to enhance their competitive position and expand their service offerings.

Innovation and Integration Drive Future Success

Success in the biogas plant market increasingly depends on companies' ability to deliver integrated solutions that address the entire value chain, from feedstock management to end-product utilization. Market players must focus on developing cost-effective and efficient technologies while maintaining strong relationships with feedstock suppliers and end-users. The industry's future belongs to companies that can effectively combine technological innovation with operational excellence, particularly in areas such as process optimization and digital integration. Companies need to develop robust risk management strategies to address feedstock availability challenges and maintain stable operations while adapting to evolving regulatory frameworks and market conditions.

Market participants must also consider the growing importance of environmental sustainability and circular economy principles in their strategic planning. Success factors include the ability to develop flexible and scalable solutions that can accommodate different types of feedstock and end-user requirements. Companies need to invest in building a strong local presence and partnerships while maintaining technological leadership through continuous innovation. The regulatory environment plays a crucial role in shaping market dynamics, with successful companies demonstrating the ability to adapt to changing policy frameworks while maintaining competitive advantages. Future market leaders will be those who can effectively balance technological innovation with market expansion while maintaining strong stakeholder relationships across the value chain. Additionally, the integration of biogas equipment is essential to enhance operational efficiency and sustainability.

Biogas Plant Industry Leaders* Engie SA

- * Ameresco Inc.
- * Gasum Oy
- * Air Liquide SA
- * EnviTec Biogas AG

* *Disclaimer: Major Players sorted in no particular order
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Recent Industry Developments* August 2021: Greenlane Renewables Inc. announced that its wholly-owned subsidiary, Greenlane Biogas North America Ltd, signed a total of USD 10.2 million in contracts for renewable natural gas (RNG) projects in the United States.

Table of Contents for Biogas Plant Industry Report1. INTRODUCTION

- * 1.1 Scope of Study
- * 1.2 Market Definition
- * 1.3 Study Assumptions
- 2. RESEARCH METHODOLOGY
- 3. EXECUTIVE SUMMARY
- 4. MARKET OVERVIEW
 - * 4.1 Introduction
 - * 4.2 Biogas Plant Installed Capacity and Forecast in MW, till 2027
 - * 4.3 Number of Biogas Projects, by Key Countries
 - * 4.4 Detailed List of Key Existing and Upcoming Biogas Plants

- * 4.5 Recent Trends and Developments
- * 4.6 Government Policies and Regulations
- * 4.7 Market Dynamics* 4.7.1 Drivers
- * 4.7.2 Restraints
- * 4.8 Supply Chain Analysis
- * 4.9 Porter's Five Forces Analysis* 4.9.1 Bargaining Power of Suppliers
- * 4.9.2 Bargaining Power of Consumers
- * 4.9.3 Threat of New Entrants
- * 4.9.4 Threat of Substitute Products and Services
- * 4.9.5 Intensity of Competitive Rivalry

5. MARKET SEGMENTATION

- * 5.1 Application* 5.1.1 Electricity Generation
- * 5.1.2 Biofuel
- * 5.1.3 Heat Generation
- * 5.2 Biogas Plant Type* 5.2.1 Small-scale Digesters
- * 5.2.2 Medium- to Large-scale Digesters
- * 5.3 Geography* 5.3.1 North America
- * 5.3.2 Asia-Pacific
- * 5.3.3 Europe
- * 5.3.4 South America
- * 5.3.5 Middle-East and Africa

6. COMPETITIVE LANDSCAPE

- * 6.1 Mergers and Acquisitions, Joint Ventures, Collaborations, and Agreements
- * 6.2 Strategies Adopted by Leading Players
- * 6.3 Company Profiles* 6.3.1 Engie SA
- * 6.3.2 Air Liquide SA
- * 6.3.3 Scandinavian Biogas
- * 6.3.4 Gasum Oy
- * 6.3.5 Ameresco
- * 6.3.6 A2A SpA
- * 6.3.7 AB Holding SpA (Gruppo AB)
- * 6.3.8 EnviTec Biogas AG
- * 6.3.9 BTS Biogas SRL/GmbH
- * 6.3.10 FWE GmbH
- * 6.3.11 Agraferm GmbH

* *List Not Exhaustive

7. MARKET OPPORTUNITIES AND FUTURE TRENDS

**Subject to Availability

Global Biogas Plant Market Report ScopeThe biogas plant market report includes:

ApplicationElectricity Generation |
 Biofuel |
 Heat Generation |
 Biogas Plant TypeSmall-scale Digesters |
 Medium- to Large-scale Digesters |
 GeographyNorth America |
 Asia-Pacific |
 Europe |
 South America |
 Middle-East and Africa |

Application | Electricity Generation |
| Biofuel |
| Heat Generation |
Biogas Plant Type | Small-scale Digesters |
| Medium- to Large-scale Digesters |
Geography | North America |
| Asia-Pacific |
| Europe |
| South America |
| Middle-East and Africa |

Key Questions Answered in the ReportWhat is the current Biogas Plant Market size ? The Biogas Plant Market is projected to register a CAGR of 3.15% during the forecast period (2025-2030)

Who are the key players in Biogas Plant Market? Engie SA, Ameresco Inc., Gasum Oyj, Air Liquide SA and EnviTec Biogas AG are the major companies operating in the Biogas Plant Market.

Which is the fastest growing region in Biogas Plant Market? Asia-Pacific is estimated to grow at the highest CAGR over the forecast period (2025-2030).

Which region has the biggest share in Biogas Plant Market? In 2025, the Europe accounts for the largest market share in Biogas Plant Market.

What years does this Biogas Plant Market cover? The report covers the Biogas Plant Market historical market size for years: 2020, 2021, 2022, 2023 and 2024. The report also forecasts the Biogas Plant Market size for years: 2025, 2026, 2027, 2028, 2029 and 2030.

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