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Bio-LNG Market Forecasts to 2032 – Global Analysis By Source Type (Agricultural Waste, Animal Manure, Food Waste, Industrial Organic Waste, Sewage Sludge, Energy Crops and Other Source Types), Production Process (Anaerobic Digestion (AD), Biogas Upgrading & Liquefaction and Thermal Gasification), Distribution Mode, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Bio-LNG Market is accounted for $2.6 billion in 2025 and is expected to reach $32.9 billion by 2032 growing at a CAGR of 43.2% during the forecast period. Bio-LNG, or biomethane-based liquefied natural gas, is a renewable fuel derived from the purification and cryogenic liquefaction of biogas produced through anaerobic digestion of organic waste. It offers similar energy density and performance as conventional LNG but with a significantly lower carbon footprint. Bio-LNG is used in heavy-duty transportation, marine fuel, and industrial energy applications as a sustainable alternative. Its compatibility with existing LNG infrastructure enables seamless integration while supporting climate goals and the transition to cleaner energy sources.

According to the International Energy Agency (IEA), Bio-LNG can reduce greenhouse gas emissions by up to 80–90% compared to diesel, making it a key renewable fuel for heavy-duty transport and shipping.

Market Dynamics:

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Driver:

Growing investment in biogas infrastructure

Governments and energy companies are actively directing capital toward the development of biogas upgrading and liquefaction facilities, driving the commercial viability of Bio-LNG. This momentum is fueled by growing climate regulations and national decarbonization roadmaps that promote renewable natural gas. Investments in cryogenic transport systems, storage terminals, and off-grid fueling stations are creating a more integrated supply chain. These infrastructure efforts are pivotal in enabling large-scale Bio-LNG deployment across industrial and mobility sectors.

Restraint:

Limited feedstock availability

Seasonal variation in agricultural residues and restricted access to municipal or industrial biowaste impact output consistency. In several regions, logistical barriers in feedstock collection and transportation also constrain plant operation rates. This challenge is further compounded by the lack of centralized waste management systems in developing countries. Ensuring long-term supply security will be key to maintaining scalability and cost competitiveness of the Bio-LNG market.

Opportunity:

Heavy-duty & long-haul transport

Bio-LNG delivers high energy density and lower CO? emissions, making it suitable for long-distance, payload-intensive routes. Fleet operators are exploring Bio-LNG-fueled trucks to comply with evolving emissions norms while maintaining operational efficiency. As more refueling infrastructure becomes available, the commercial viability of Bio-LNG as an alternative transport fuel will strengthen.

Threat:

Competition from other green fuels

Bio-LNG faces competition from other green fuels such as green hydrogen, renewable methanol, and ammonia, particularly in the transport and marine sectors. These

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alternatives are attracting increasing R&D funding and policy incentives, which may redirect investments away from Bio-LNG infrastructure. In addition, certain green fuels offer faster decarbonization pathways or greater scalability potential.

Covid-19 Impact:

The COVID-19 pandemic created temporary disruptions in Bio-LNG project development and supply chains due to mobility restrictions and reduced industrial activity. Delays in biogas plant construction permit approvals, and component imports initially slowed market momentum. However, the shift toward energy self-sufficiency and sustainability goals in post-pandemic recovery strategies revitalized interest in low-carbon fuels. These renewed commitments are expected to support steady growth and recovery across regional markets.

The agricultural waste segment is expected to be the largest during the forecast period

The agricultural waste segment is expected to account for the largest market share during the forecast period attributed to their widespread availability and favorable gas yield make them a preferred input for biogas production. Countries with large agro-industrial bases are leveraging agricultural waste to reduce methane emissions and support circular economy goals. Innovations in waste pretreatment and digestion efficiency are further enhancing yield and scalability.

The anaerobic digestion (AD) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the anaerobic digestion (AD) segment is predicted to witness the highest growth rate due to its proven efficiency in converting organic matter into biogas, which can then be upgraded into Bio-LNG. This biological process is favored for its adaptability across various substrates including agricultural residues, wastewater sludge, and organic industrial waste. Increasing deployment of modular AD units and advancements in microbial optimization are improving output performance.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share driven by strong agricultural production, growing energy demand, and government initiatives for rural bioenergy. Nations such as China and India are scaling up bioenergy infrastructure to reduce dependence on imported fossil fuels and mitigate

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urban waste challenges. Collaborative projects between public entities and private players are accelerating facility development.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR owing to aggressive climate targets, technological innovation, and an expanding renewable gas ecosystem. The U.S. and Canada are investing in advanced biogas upgrading facilities and establishing Bio-LNG corridors for freight mobility. Policy instruments such as Low Carbon Fuel Standards (LCFS) and Renewable Fuel Standards (RFS) offer financial incentives that drive production scale-up.

Key players in the market

Some of the key players in Bio-LNG Market include Wartsila Corporation, Verbund AG, Verbio Vereinigte BioEnergie AG, Veolia Environnement S.A., TotalEnergies SE, Shell plc, Scandinavian Biogas Fuels International AB, Nature Energy Biogas A/S, Linde plc, Hitachi Zosen Inova AG, Gasum Oy, Everfuel A/S, EnviTec Biogas AG, Engie SA, Clean Energy Fuels Corp., Bioenergy DevCo, Archaea Energy Inc., Air Liquide, and Aemetis, Inc.

Key Developments:

In May 2025, TotalEnergies SE, it signed a SPA to purchase 2 Mtpa of LNG and acquired a 5% stake in the Ksi Lisims LNG project in British Columbia for a 20-year term.

In April 2025, Wartsila Corporation secured contracts to supply two bioLNG plants in Finland (Nurmo and Kiuruvesi), each with 25 t/day capacity. These facilities will convert manure and food-processing waste into sustainable bio-LNG and bio-fertilizer, supporting decarbonized transport and agriculture.

In April 2025, TotalEnergies signed a Sales & Purchase Agreement (SPA) with NextDecade to offtake 1.5 Mtpa of LNG for 20 years from Rio Grande’s future Train 4. This agreement underpins the FID process and strengthens TotalEnergies' LNG supply portfolio

Source Types Covered:

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- Agricultural Waste
- Animal Manure
- Food Waste
- Industrial Organic Waste
- Sewage Sludge
- Energy Crops
- Other Source Types

Production Processes Covered:

- Anaerobic Digestion (AD)
- Biogas Upgrading & Liquefaction
- Thermal Gasification

Distribution Modes Covered:

- On-Site Liquefaction & Use
- Off-Site Liquefaction with Road Tanker Transport
- Pipeline Injection (as biomethane before liquefaction)
- LNG Refueling Stations

Applications Covered:

- Transportation Fuel

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- Power Generation
- Industrial Processes
- Residential Heating
- Blending with Conventional LNG

End Users Covered:

- Marine & Shipping
- Energy & Utilities
- Agriculture
- Industrial Manufacturing
- Residential & Commercial
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK

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- Italy
- France
- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia

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UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

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Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Contents

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10 GLOBAL BIO-LNG MARKET, BY GEOGRAPHY

+357 96 030922
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11 KEY DEVELOPMENTS

12 COMPANY PROFILING

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List Of Tables

LIST OF TABLES

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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