

Pyrolysis Oil Market Forecasts to 2034 – Global Analysis By Feedstock (Plastic Waste, Rubber & Tires, Biomass and Mixed Municipal Solid Waste), Technology, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Pyrolysis Oil Market is accounted for \$1.8 billion in 2026 and is expected to reach \$5.7 billion by 2034 growing at a CAGR of 16.0% during the forecast period. Pyrolysis oil, often referred to as bio-oil, is a combustible liquid obtained by heating organic substances like biomass, plastic waste, or other residues without oxygen. This high-temperature conversion process, known as pyrolysis, produces a dense, dark fluid with significant energy potential. It serves as a sustainable substitute for conventional fossil fuels in applications such as electricity production, industrial heating, and energy generation. By converting waste into usable fuel, it supports environmental sustainability and lowers emissions. Nonetheless, issues including chemical instability, corrosiveness, and the requirement for further refining restrict its direct application in standard fuel engines and existing infrastructure systems.

According to the European Commission's Innovation Fund, more than €118 million has been allocated to pyrolysis-based recycling projects in Europe, supporting large-scale deployment of advanced recycling technologies in 2025.

Market Dynamics:

Driver:

Growing demand for sustainable and renewable fuels

Rising emphasis on lowering greenhouse gas emissions and adopting cleaner energy

options is significantly boosting the pyrolysis oil market. Governments and industries are increasingly prioritizing renewable fuel sources to replace traditional fossil-based energy. Pyrolysis oil, derived from biomass and waste, stands out as a sustainable alternative due to its reduced environmental impact. Global climate commitments and stricter environmental regulations are further encouraging the adoption of such fuels. This growing shift toward eco-friendly energy solutions is driving demand across applications like electricity generation, industrial processes, and transport, thereby contributing to the steady expansion of the pyrolysis oil industry globally.

Restraint:

High production and processing costs

Elevated expenses related to production and processing remain a key limitation for the pyrolysis oil market. Setting up pyrolysis plants involves heavy investment in specialized machinery, infrastructure, and pollution control systems. In addition, ongoing operational expenditures such as energy usage, labor, and maintenance increase the financial burden. The necessity to upgrade and refine the produced oil for compatibility with existing fuel standards further raises costs. These financial challenges create barriers for new entrants and hinder rapid market expansion. As a result, the overall growth of the pyrolysis oil industry is constrained by the high capital and operational requirements involved.

Opportunity:

Advancements in upgrading and refining technologies

Ongoing developments in refining and upgrading methods are creating promising opportunities for the pyrolysis oil market. Innovative approaches like catalytic treatment and hydroprocessing are improving the fuel's properties by enhancing stability and lowering oxygen levels. These improvements make pyrolysis oil more suitable for use alongside traditional fuels in various sectors. Increased focus on research and innovation is also making these processes more cost-effective and efficient. As these technologies continue to advance, they are likely to address current challenges and broaden the applicability of pyrolysis oil, thereby boosting its adoption across multiple industries and global energy systems.

Threat:

Competition from alternative renewable fuels

A major threat to the pyrolysis oil market comes from the growing presence of other renewable fuels like biodiesel, ethanol, and green hydrogen. These energy sources are advancing quickly and often have stronger infrastructure and market familiarity. Many governments and industries are focusing on these alternatives due to their proven efficiency and scalability. As competing technologies continue to evolve, they may overshadow pyrolysis oil in terms of adoption and investment. This competitive pressure can make it difficult for pyrolysis oil to expand its market share, thereby restricting its growth potential and reducing its prominence in the global renewable energy landscape.

Covid-19 Impact:

The outbreak of COVID-19 influenced the pyrolysis oil market in both negative and positive ways. Restrictions and lockdown measures slowed industrial operations, leading to delays in projects and reduced demand for alternative fuels. Supply chain disruptions made it difficult to source raw materials and essential equipment, impacting production efficiency. On the other hand, the pandemic increased awareness of effective waste management practices, encouraging the adoption of waste-to-energy solutions such as pyrolysis. The surge in plastic waste also emphasized its importance. With economic recovery, growing focus on sustainability and green investments has supported the market's gradual recovery and future expansion.

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

The plastic waste segment is expected to account for the largest market share during the forecast period, mainly due to its widespread presence and high fuel generation potential. The surge in plastic usage in packaging, household products, and industries has resulted in large volumes of waste worldwide. Pyrolysis technology effectively transforms this persistent waste into useful fuel, helping to tackle environmental challenges while meeting energy needs. Compared to other materials, plastics produce higher oil yields, making them more economically attractive. Increasing regulations on plastic disposal and the shift toward sustainable resource utilization are reinforcing the leading position of the plastic waste segment in the market.

The catalytic pyrolysis segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the catalytic pyrolysis segment is predicted to witness the highest growth rate, driven by its capability to produce higher-quality fuel and improve processing performance. The use of catalysts enables more efficient breakdown of feedstock, resulting in oils with reduced oxygen levels and enhanced stability. This makes the fuel more suitable for existing infrastructure and broader industrial use. Growing investments in advanced biofuel technologies and continuous innovation are supporting its expansion. Furthermore, increasing demand for cleaner energy alternatives is prompting industries to adopt catalytic pyrolysis, positioning it as the fastest-growing segment in the global pyrolysis oil market.

Region with largest share:

During the forecast period, the Asia-Pacific region is expected to hold the largest market share, driven by fast-paced industrial growth, rising energy requirements, and increasing waste volumes in countries like China, India, and Southeast Asia. Rapid urban development and population expansion have intensified the need for effective waste disposal and energy recovery solutions. Pyrolysis technology is gaining traction as a sustainable approach to convert waste into fuel. Supportive government policies and initiatives promoting clean energy further strengthen market expansion. Moreover, cost advantages and improving industrial capabilities contribute to regional growth. These combined factors establish Asia-Pacific as the leading contributor to the global pyrolysis oil market.

Region with highest CAGR:

Over the forecast period, the Europe region is anticipated to exhibit the highest CAGR, supported by strict environmental policies and well-established waste management infrastructure. The region actively promotes circular economy initiatives, driving the transformation of waste materials into usable energy sources. Strong governmental focus on lowering carbon emissions and minimizing landfill use is boosting the adoption of pyrolysis solutions. Increased funding and partnerships in research and development are also enhancing technological advancements in this field. With a growing preference for sustainable fuels and cleaner energy options, Europe is emerging as the most rapidly expanding region in the global pyrolysis oil market.

Key players in the market

Some of the key players in Pyrolysis Oil Market include Agilyx, Brightmark, Plastic Energy, Recycling Technologies, Neste, Chevron Phillips Chemical, Mitsubishi

Chemical Corporation, Shell, BP, TotalEnergies, Dow Inc., LyondellBasell, Borealis, Nexus Circular, Encina Development Group, Klean Industries, Green Fuel Nordic and OMV Group.

Key Developments:

In April 2026, TotalEnergies and Masdar have signed a binding agreement to establish a \$2.2 billion joint venture aimed at expanding renewable energy capacity in nine countries across Asia. The joint venture will have a portfolio capacity of 3 GW of operational assets and 6 GW of assets in advanced development, which are expected to be operational by the end of the decade.

In September 2025, Mitsubishi Chemical Corporation has officially announced that it has entered into an Agreement on Coordination and Cooperation for the Maintenance and Development of the Yokkaichi Industrial Complex. This agreement, involves three parties—Mitsubishi Chemical, Mie Prefecture, and Yokkaichi City.

In June 2025, LyondellBasell (LYB) has announced that it has entered into an agreement and exclusive negotiations with German industrial group AEQUITA for the potential sale of four of its European olefins and polyolefins assets. The agreement marks a pivotal move in LyondellBasell's previously disclosed strategic review of its European operations.

Feedstocks Covered:

Plastic Waste

Rubber & Tires

Biomass

Mixed Municipal Solid Waste

Technologies Covered:

Fast Pyrolysis

Slow Pyrolysis

Flash Pyrolysis

Catalytic Pyrolysis

Applications Covered:

Fuel

Chemicals

Power Generation

Other Applications

End Users Covered:

Energy & Power

Automotive

Chemicals & Petrochemicals

Marine

Industrial & Manufacturing

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of 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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

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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