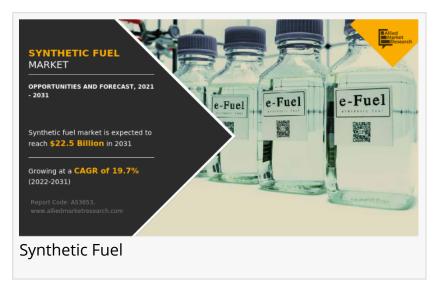


Synthetic Fuel Market Size to witness substantial gains by 2031

Global Synthetic Fuel Market is estimated to hit US\$ 22.5 billion by 2031

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The <u>synthetic fuel market</u> size was valued at \$3.9 billion in 2021, and is estimated to reach \$22.5 billion by 2031, growing at a CAGR of 19.7% from 2022 to 2031. Synthetic fuel, also known as synfuel or synthetic



hydrocarbon fuel, is a type of fuel that is produced from non-petroleum sources through chemical processes, typically involving the conversion of carbon-containing feedstocks, such as coal, natural gas, biomass, or carbon dioxide (CO2), into liquid or gaseous fuels. Synthetic fuels are considered an alternative to traditional fossil fuels and have several potential benefits, including reducing greenhouse gas emissions and providing a stable energy supply.

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The key players operating in the synthetic fuel industry are

Sasol

Indian Oil Corporation

Shell Plc

Exxon Mobil Corporation

Reliance

Robert Bosch GmbH

Air Liquide

PetroChina

Phillips 66

SG Preston Company

North America dominated the synthetic fuel market and is expected to grow at a CAGR of 19.9% during the forecast period.

Types of Synthetic Fuels:

Synthetic Gasoline: This is a liquid fuel produced from carbon sources like coal, natural gas, or biomass. It can be used as a drop-in replacement for conventional gasoline in internal combustion engines.

Synthetic Diesel: Similar to synthetic gasoline, synthetic diesel is a liquid fuel produced from various feedstocks. It can be used as a substitute for traditional diesel fuel in diesel engines.

Synthetic Natural Gas (SNG): SNG is a synthetic gas that closely resembles natural gas. It is often produced through gasification processes and can be used for heating, electricity generation, and as a fuel for natural gas vehicles.

Hydrogen: Hydrogen can be produced synthetically through processes like electrolysis or steam methane reforming (SMR). It is considered a synthetic fuel when produced from non-fossil sources like renewable electricity or biomass.

The synthetic fuel market is gaining momentum over the last few years. This can be attributed to continuous efforts made to achieve a carbon-neutral economy.

The goal of producing synthetic fuel is to reduce the dependency on traditional fossil fuels and mitigate their environmental impact. Synfuels can be produced using a variety of processes, including gasification, liquefaction, and Fischer-Tropsch synthesis. While synthetic fuel can have similar properties to traditional petroleum-based fuels, the production process can be energy-intensive and costly. However, ongoing research and development in this field are focused on improving the efficiency and reducing the cost of producing synthetic fuel.

The benefits of synthetic fuels such as reduced carbon emissions and sustainable fuel economy are the major driving factors for the industry growth.

By application, the market is segmented into gasoline, diesel, and kerosene. Synthetic diesel is made from feedstocks that contain carbon. Synthetic diesel has high cetane content and little to no sulfur. This means it has particularly good properties which can be used to improve engine performance.

Due to their exposure to bacteria, the hydrocarbons in the heavy oils are broken down, which is why they are in different physical forms. The synthetic fuel produced from extra heavy oils is termed Syncrude which needs further refining to be able to use commercially.

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Production Methods:

Gasification: This process involves heating carbon-based feedstocks in the presence of oxygen or steam to produce a synthetic gas (syngas) composed of hydrogen and carbon monoxide. Syngas can be further processed into various synthetic fuels.

Fischer-Tropsch Synthesis: Fischer-Tropsch is a catalytic chemical process that converts syngas into liquid hydrocarbons, such as synthetic diesel and synthetic jet fuel.

Hydrogenation: Hydrogenation processes involve the addition of hydrogen to unsaturated hydrocarbons to create synthetic fuels.

Pyrolysis: Pyrolysis is a thermal decomposition process that converts biomass and organic waste into synthetic biofuels like bio-oil and syngas.

The synthetic fuel market growth was led by Germany and the UK in the Europe. This was owed to the presence of significant industry players investing thoroughly in the technologies to develop synthetic fuel.

Advantages of Synthetic Fuels:

Reduced Greenhouse Gas Emissions: When produced from renewable energy sources or biomass, synthetic fuels can have significantly lower carbon emissions compared to fossil fuels.

Energy Security: Synthetic fuels can reduce dependence on fossil fuel imports and provide a more stable energy supply.

Compatibility: Synthetic fuels can be used in existing infrastructure and engines without significant modifications, making them a potential drop-in solution.

Fuel Versatility: Different types of feedstocks and production methods can be used to produce a range of synthetic fuels, increasing versatility.

By raw material, natural gas is projected to grow at the highest CAGR of approximately 20.0%, in terms of during the synthetic fuel market forecast period.

Corn stover, softwoods, hardwood, switchgrass, and miscanthus are feedstocks used for synthetic fuel production. The combustion of these feedstocks produces carbon dioxide which is captured for further use in the production process of synthetic fuels.

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The region is witnessing an energy transition away from fossil fuels at a relatively higher rate and thus synthetic fuel production is being boosted by government and industry players.

The impact of the Russo-Ukrainian war has also led the European Union to diversify its primary energy mix away from fossil fuels and thus act as a driving force for the Europe synthetic fuel industry growth.

The availability of alternative fuels and the higher cost of synthetic fuels discourage the overall synthetic fuel industry growth.

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