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Syngas Market Report and Forecast 2025-2034

Market Report | 2025-06-30 | 158 pages | EMR Inc.

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Report description:

The global syngas market size reached approximately 415.03 thermal GW in 2024. The market is projected to grow at a CAGR of 7.80% between 2025 and 2034, reaching a volume of around 879.56 thermal GW by 2034.

Synthetic gas, also known as syngas, is a combination of gases such as hydrogen, carbon monoxide, small quantities of carbon dioxide, and other trace gases such as methane and hydrocarbon. It is a combustible gas mix produced from solid fuel using high-temperature and high-pressure gasification. It finds applications in gas turbines, as a solid oxide fuel cell anode gas, and as a feedstock for synthetic natural gas and liquid fuels.

Synthetic gas can be used as a source of hydrogen and as a fuel itself. It's particularly useful in the production of hydrocarbon fuels such as diesel and methanol. It is also instrumental in the production of industrial chemicals, especially ammonia, which is a key ingredient in fertilisers. It can be burned similarly to natural gas, with some portion used to power gasification plants and the remainder sold to utility companies for electricity production.

Before being used, syngas needs to be cleaned of contaminants like chlorides, mercury, and sulphur. It is conditioned to alter the hydrogen-to-carbon monoxide ratio, making it suitable for various applications.

Key Trends in the Market

Growing usage of syngas in the chemical sector

The syngas market demand is expected to grow during the forecast period due to the increasing demand for this gas in the chemical sector. Syngas is utilised to manufacture synthetic natural gas (SNG), which is then used in trains, ships, and trucks as liquefied natural gas (LNG) and compressed natural gas (CNG).

Syngas is a key component in the production of various chemicals. It is used to manufacture methanol, which is a precursor for producing formaldehyde, acetic acid, and various acetates. Methanol itself is a versatile chemical that finds applications in the production of resins, plastics, pharmaceuticals, paints, adhesives, and fuels.

Further, syngas is crucial in the Haber process for producing ammonia, which is a fundamental ingredient in fertilisers. The growing global demand for agricultural products and the need to enhance agricultural productivity have led to increased use of fertilisers, thereby boosting the demand for syngas.

Increasing demand for syngas derived from biomass and sustainable feedstocks as an alternative to fossil fuels

As concerns over climate change and emissions intensify, governments worldwide are imposing strict greenhouse gas regulations and emissions targets while restricting the use of fossil fuels. This is one of the major syngas market trends as syngas is often derived from biomass and sustainable feedstocks, making it an attractive alternative to fossil fuels.

Biomass is a renewable organic material that comes from plants and animals. Using biomass to produce syngas is a sustainable process that contributes to the circular economy, turning waste and other organic materials into valuable energy resources. Syngas produced from biomass is often considered carbon-neutral. The carbon dioxide released during its combustion is roughly equal to the CO_2 absorbed by the plants during their growth phase, creating a balanced carbon cycle.

The increasing focus on renewable energy to meet climate goals has led to greater support for technologies like biomass gasification for syngas production. This includes financial incentives, research and development funding, and policy support.

Multiple benefits of syngas facilitate diverse applications, favouring the market growth

Several key advantages, such as cost-effectiveness, improved stability in energy supply, and extensive applications in fuelling gas engines, are favouring the global syngas market growth. Moreover, the increasing use of syngas in a variety of industrial processes, including chemical manufacturing, power generation, and refining is likely to propel the market in the coming years.

One of the primary advantages of syngas is its cost-effectiveness, especially when derived from low-cost or waste feedstocks. The ability to convert a variety of materials, including biomass, coal, and municipal waste, into a valuable energy source makes syngas an economically attractive option. Syngas also contributes to the stability of the energy supply. Unlike some renewable energy sources that can be intermittent (like solar or wind), syngas can be produced and stored for use when needed.

The versatility of syngas in various applications further enhances its market demand. It can be used for electricity generation, heating, and as a raw material in the production of chemicals and synthetic fuels.

Syngas Market Segmentation

The EMR's report titled "Syngas Market Report and Forecast 2025-2034" offers a detailed analysis of the market based on the following segments:

Market Breakup by Gasifier Type

- Moving Bed Gasifier
- Fluidised Bed Gasifier
- Entrained Flow Gasifier
- Others

Market Breakup by Feedstock

- Coal
- Natural Gas
- Biomass and Waste
- Others

Market Breakup by Technology

- Steam Reforming
- Partial Oxidation
- Autothermal Reforming
- Combined or Two-step Reforming
- Biomass Gasification

Market Breakup by Application

- Chemicals
- Power Generation
- Liquid Fuels
- Gaseous Fuels
- Others

Market Breakup by Region

- North America
- Europe
- Asia Pacific
- Latin America
- Middle East and Africa

Market Share by Feedstock

According to the global syngas market analysis, coal is expected to be one of the major feedstocks used in the production of syngas and its derivatives, and it is likely to guide the market development in the coming years. The use of coal in syngas can be associated with its widespread availability for energy generation and its compatibility with various technologies used for syngas production. Additionally, the segment's growth can be attributed to the abundant coal reserves found in countries like China, the United States, and Russia.

Using coal as a feedstock can be more cost-effective compared to other sources, especially in coal-rich countries. This cost advantage is a key factor in its widespread use in syngas production. Coal's high carbon content makes it an efficient feedstock for syngas production. The carbon-rich nature of coal enables the production of a high yield of syngas.

Market Share by Application

Chemicals are likely to account for a significant syngas market share during the forecast period. This is primarily driven by a growing need for environmentally friendly chemicals to create various end products. Syngas and its derivatives are extensively employed in the chemical sector, particularly in the production of fertilisers, petrochemicals, and oxo chemicals, depending on the ratio of hydrogen to carbon monoxide (H_2/CO).

Ammonia production, which relies heavily on syngas, is critical for the fertiliser sector. Given the global demand for agricultural yield enhancement, the need for ammonia and thus syngas is substantial. Syngas production offers feedstock flexibility, which means it can be produced from a variety of materials, including coal, natural gas, biomass, and even waste products. This versatility makes it an attractive option for diverse chemical production processes.

Regional Insights

The market in the Asia Pacific region is experiencing significant growth, primarily driven by the increasing demand for electricity and the growing chemical sector.

A key trend in the Asia Pacific market for syngas is the increasing use of syngas in the power generation sector. Integrated Gasification Combined Cycle (IGCC) plants, which use gasifiers to convert coal or other carbon-based materials to syngas, are an example of how syngas is being used to generate electricity efficiently and with low emissions. Additionally, biogas obtained through the thermochemical gasification of synthetic gas is another area where syngas is gaining traction as a renewable energy source.

Competitive Landscape

The comprehensive EMR report provides an in-depth assessment of the market based on Porter's five forces model along with giving a SWOT analysis. The report analyses the following key players in the global syngas market, covering their competitive landscape and the latest developments like mergers, acquisitions, investments, and expansion plans.

Linde plc

Linde plc is a prominent company in the industrial gases and engineering sector, with a history dating back to the 19th century. The company's establishment took place in 2018, following a merger between Linde AG and Praxair, Inc. Currently headquartered in Guildford, the United Kingdom, Linde plc's primary focus lies in the production and global distribution of an array of industrial gases, encompassing oxygen, nitrogen, argon, carbon dioxide, and specialised gases, among others.

Shell Plc

Shell Plc, officially known as Royal Dutch Shell Plc, is one of the world's largest and most renowned energy companies, with a rich history dating back to the late 19th century. Headquartered in The Hague, the Netherlands, and incorporated in the United Kingdom, Shell is a global leader in the energy sector, operating in multiple segments, including oil and gas exploration, production, refining, distribution, and marketing, as well as a growing focus on renewable energy and sustainable solutions.

L'AIR LIQUIDE S.A.

L'AIR LIQUIDE S.A., commonly known as Air Liquide, is a global company operating in the industrial gases and services sector, boasting a history that spans more than a century. The company was established in France back in 1902 and has since evolved into one of the foremost suppliers of industrial gases on a worldwide scale. In addition to its gas-related offerings, Air Liquide also provides a range of associated services and cutting-edge technologies.

Other major syngas market players include Casale SA, Synthesis Energy Systems, Inc., Sasol Limited, Maire Tecnimont SpA, Johnson Matthey Plc, Grannus, LLC, and Air Products and Chemicals, Inc., among others.

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