India Syngas Market By Production Technology (Steam Reforming, Partial Oxidation, Autothermal Reforming, Biomass Gasification, Others), By Application (Chemicals & Fertilizer, Fuels, Electricity), By Region, Competition, Forecast and Opportunities, 2020-2030F

Market Report | 2024-11-30 | 85 pages | TechSci Research

AVAILABLE LICENSES:

- Single User License $3500.00
- Multi-User License $4500.00
- Custom Research License $7000.00

Report description:

India Syngas Market was valued at USD 18.56 Million in 2024 and is expected to reach USD 22.20 Million by 2030 with a CAGR of 3.23% during the forecast period. Syngas, or synthesis gas, primarily consists of hydrogen and carbon monoxide and serves as a versatile intermediary for producing chemicals, fuels, and electricity. It can be generated from various feedstocks, including natural gas, coal, biomass, and waste materials. The syngas market in India is gaining momentum due to its significance in sustainable energy production and its potential to lessen dependence on traditional fossil fuels. Syngas can be utilized for electricity generation and acts as a precursor for manufacturing chemicals such as methanol and ammonia.

Additionally, syngas can be transformed into liquid fuels through Fischer-Tropsch synthesis. As India's population and industrial activities expand, the demand for energy is increasing, highlighting the need for alternative energy sources like syngas. The Indian government is actively promoting clean energy technologies and gasification projects, fostering a favorable environment for syngas production. The growing emphasis on waste management and the use of agricultural residues further contribute to market expansion.

However, the high capital investment needed for syngas production facilities poses a challenge. The potential of syngas in hydrogen production and as a feedstock for methanol and ammonia also presents new growth opportunities. Increased investments in research and development could lead to more efficient production methods and reduced costs.

The India syngas market is set for significant growth in the coming years, propelled by rising energy demands, technological advancements, and supportive government policies. As the country moves towards more sustainable energy solutions, syngas is anticipated to play a crucial role in ensuring energy security and environmental sustainability.

Key Market Drivers

Rising Energy Demand

The growing energy demand in India is a complex factor that plays a crucial role in the expansion of the syngas market. With a population exceeding 1.36 billion and a rapidly developing economy, India is experiencing a significant increase in energy needs driven by urbanization and the growth of the manufacturing sector. This demand is primarily met through various energy sources, with coal projected to remain the dominant supply.

According to the International Energy Agency (IEA), India's electricity demand is expected to surpass that of China and achieve the fastest growth rate globally by 2026, with coal-fired generation projected to satisfy 68% of that demand. Between 2024 and 2026, electricity demand in India is anticipated to rise by an average of 6.5% annually. A larger population translates to increased energy requirements for essential services such as heating, cooling, cooking, and transportation. This growing populace also drives the need for infrastructure development-including schools, hospitals, and roads-further amplifying energy resource requirements.

The government's "Make in India" initiative aims to enhance domestic manufacturing, resulting in heightened energy demands from factories and production facilities. Industries such as textiles, chemicals, and automotive are expanding, each with unique energy needs that call for reliable energy sources. Additionally, urban migration is accelerating, with millions relocating to cities for better opportunities. Government programs like the Smart Cities Mission are investing in energy-efficient infrastructure, necessitating sustainable energy solutions, including syngas for power generation.

The International Monetary Fund (IMF) forecasts India's GDP to grow by approximately 6-7% annually, which will contribute to increased energy consumption across sectors. As the middle class expands, there is a growing demand for consumer goods that require energy for manufacturing. Rising incomes also lead to more households acquiring energy-intensive appliances like refrigerators and washing machines, further escalating overall energy demand.

In response to severe air quality issues in major cities like Delhi, the government is promoting cleaner energy alternatives. Initiatives to transition industrial processes to cleaner fuels, including syngas, are gaining momentum. Additionally, the Indian government's commitment to achieving a renewable energy target of 500 GW by 2030 positions syngas as a vital complementary energy source to stabilize supply amid fluctuating renewable outputs. Efforts to reduce reliance on imported crude oil and coal include the development of domestic syngas projects, with companies exploring biomass and agricultural waste for syngas production. For instance, the Indian Oil Corporation is implementing projects that convert municipal solid waste into syngas.

The increasing energy demand in India is a significant driver of the syngas market, influencing various sectors and accelerating the shift toward alternative energy solutions. By addressing challenges related to population growth, industrialization, urbanization, and environmental concerns, the syngas market is well-positioned for substantial growth in the coming years, bolstered by government initiatives and technological advancements.

Government Initiatives

Government initiatives are pivotal in shaping the syngas market in India. As part of its transition to cleaner coal technologies, the country has launched a coal gasification mission aimed at converting 100 million tonnes of coal into gas by 2030. This initiative fosters a favorable environment for syngas as a complementary energy source that can help stabilize the energy grid.

To promote the establishment of syngas production facilities, the government provides financial support through grants and subsidies, thereby alleviating the capital burden on companies and encouraging private sector involvement. For instance, In April 2023, an ambitious plan to convert 100 million tonnes of annual coal production into gas secured USD 83.37 Billion in investments, bolstered by joint ventures established between major public sector undertakings such as BHEL, Indian Oil, and GAIL with Coal India for large-scale syngas projects.

To incentivize coal gasification, the government offers a 50% rebate on revenue shares in commercial auction policies for gasification coal, establishes a new sub-sector for syngas production, and provides long-term coal allocations to gasification plants. Additionally, the government supports research and development initiatives aimed at enhancing syngas production technologies, which can lead to more efficient processes and reduced costs, making syngas more competitive in the energy market.

The government is also investing in infrastructure to bolster syngas production and distribution, which includes developing gasification plants and improving the supply chain. For instance, In January 2024, the Cabinet approved an USD 1.01 Billion scheme for coal gasification, divided into three categories. Category I allocates USD 482.37 Million for government PSUs, allowing

up to three projects to receive grants of USD160.79 Million or 15% of capital expenditure (capex), whichever is lower. Category II involves a USD 458.55 Million allocation for projects blending private sector and government PSUs, with each project eligible for a USD 119.10 Million grant or 15% of capex, selected through a tariff-based bidding process with NITI Aayog. Category III focuses on demonstration and small-scale gasification plants, receiving USD 71.46 Million for projects with a minimum capex of USD 11.91 Million and a production of at least 1,500 Nm□/hr of synthetic gas, granting USD 11.91 Million or 15% of capex, whichever is less. Initiatives like the Swachh Bharat Mission encourage effective waste management and the conversion of waste into energy, including syngas, thereby addressing waste disposal issues while providing a sustainable energy solution. Public campaigns aimed at educating industries and the general populace about the benefits of clean energy can further drive demand for syngas as a viable alternative.

Through a comprehensive strategy that encompasses supportive policies, financial incentives, research and development efforts, waste management initiatives, infrastructure investments, and public education, the government is creating a conducive environment for syngas production. As India tackles its energy challenges and seeks sustainable solutions, the syngas market is well-positioned for substantial growth, playing a crucial role in the nation's energy landscape.

Key Market Challenges

High Capital Costs

High capital costs present a considerable challenge for the syngas market in India, affecting both new entrants and established players. Setting up syngas production facilities requires a substantial initial investment, covering expenses related to technology, equipment, and construction, which can amount to billions of rupees. These high upfront costs can deter potential investors, making it difficult for new projects to secure the necessary funding to get started.

Smaller companies and startups often struggle to obtain financing due to the perceived risks associated with these substantial capital requirements, leading traditional financing sources to be less inclined to invest in high-risk energy projects. Additionally, the return on investment for syngas initiatives typically takes time to realize, resulting in hesitance from investors who might favor quicker returns in more established industries. Although advancements in syngas production technology can improve efficiency, the initial costs for these innovations can be prohibitively high, causing companies to hesitate in adopting them.

High capital costs also limit the scalability of operations; without economies of scale, production costs remain elevated, making syngas less competitive compared to cheaper fossil fuels and emerging renewable energy sources. This inability to scale effectively can impede syngas's market share, especially as competitors in the fossil fuel and renewable sectors enjoy lower initial costs. Furthermore, the significant capital investment raises the financial risks associated with syngas projects, where any operational or market setbacks can result in substantial losses, further discouraging new investments. To address these challenges, stakeholders should consider innovative financing solutions, government incentives, and strategic partnerships that can ease the financial burden and support the sustainable growth of syngas production.

Infrastructure Limitations

Infrastructure limitations present a major challenge to the growth and efficiency of the syngas market in India. The existing number of gasification plants is inadequate to satisfy the increasing demand for syngas, hindering overall production capacity and market expansion. Many current facilities rely on outdated technologies that do not meet the efficiency requirements for large-scale production. Additionally, the absence of a robust transportation infrastructure restricts the availability and accessibility of syngas, negatively impacting both producers and consumers and creating inefficiencies in the supply chain. Integrating syngas into existing energy grids is also complex, as the current infrastructure may not be equipped to accommodate its unique properties.

Furthermore, sourcing and processing feedstocks like coal, biomass, and waste materials can be hindered by insufficient transportation and storage capabilities. The development of essential infrastructure for syngas production and distribution demands significant investment, which can deter both public and private stakeholders.

Infrastructure projects typically have long lead times, causing delays in the establishment of crucial facilities and systems needed for market growth. Environmental regulations can further complicate infrastructure development, leading to increased costs and potential project delays. To address these challenges, strategic investments in infrastructure, improvements in logistics, and enhancements in regulatory frameworks are crucial. By tackling these infrastructure issues, India can enhance the growth prospects of its syngas market and contribute to a more sustainable energy future.

Key Market Trends

Emergence of Biomass and Waste Feedstocks

India's expansive agricultural sector generates significant quantities of biomass, including crop residues and other organic materials. These residues offer a valuable opportunity for syngas production, allowing farmers to increase their income while managing waste effectively. The utilization of agricultural waste supports a circular economy by minimizing the environmental impact associated with burning or disposing of these materials and converting them into energy.

The challenge of managing municipal solid waste (MSW) has heightened interest in transforming waste into energy. Producing syngas from MSW can alleviate waste disposal problems while providing usable energy. For example, in August 2024, researchers from the School of Infrastructure at the Indian Institute of Technology (IIT) Bhubaneswar developed an innovative solar-powered microwave pyrolysis reactor. This reactor is designed to extract valuable resources from both segregated and mixed waste materials, including biomass and plastics. Utilizing microwave-assisted pyrolysis, it efficiently converts waste into valuable products such as highly porous carbon (biochar), bio-oil, and syngas, depending on the feedstock and operating conditions. This technology leverages microwave radiation to generate uniform heat within the feedstock, enabling rapid conversion into end products while maintaining precise control over the reactions. Additionally, the reactor operates entirely on solar power, promoting sustainability and self-sufficiency without adding to energy demands.

Using biomass and waste as feedstocks for syngas production decreases reliance on fossil fuels, thereby reducing greenhouse gas emissions and supporting India's climate objectives. Converting waste into energy helps divert materials from landfills, lowering pollution and contributing to cleaner urban environments. Advancements in gasification technology are making it increasingly feasible to transform a variety of biomass and waste feedstocks into syngas, with innovations in pre-treatment and conversion methods improving efficiency and output.

The Indian government is actively promoting the use of biomass and waste for energy production through various incentives and subsidies, creating a conducive environment for investment in syngas projects utilizing these feedstocks. The trend of leveraging biomass and waste in the Indian syngas market is expected to grow, driven by sustainability initiatives, technological advancements, and supportive government policies. This shift not only meets energy demands but also enhances waste management, environmental protection, and economic opportunities, positioning syngas as a crucial element in India's future energy landscape.

Segmental Insights

Production Technology Insights

Based on Production Technology, the Steam Reforming emerged as the dominating segment in the Indian market for Syngas during the forecast period. Steam reforming is a well-established and widely adopted technology in the industry for hydrogen production and chemical synthesis. Its proven reliability and efficiency make it a preferred option for producers. This method is recognized for its high conversion efficiency, yielding syngas with an ideal hydrogen-to-carbon monoxide ratio, which is crucial for various downstream applications such as chemical synthesis and fuel production. Additionally, steam reforming can be scaled to meet the demands of large industrial operations, offering significant production capacity for large-scale applications.

In India, the existing natural gas distribution infrastructure supports the use of steam reforming, thereby lowering initial capital expenditures and minimizing logistical challenges when establishing new production facilities. The cost structure of steam reforming is also more favorable compared to alternative methods, as its efficient resource utilization and established technology help reduce operational costs and enhance competitiveness. These advantages collectively establish steam reforming as the leading technology in the Indian syngas market, ensuring its sustained prominence given the country's natural gas resources and supportive infrastructure.

Application Insights

Based on Application, Chemicals & Fertilizer emerged as the fastest growing segment in the Indian market for Syngas in 2024. With the growth of India's agricultural sector and a rising population, the demand for fertilizers to improve crop yields is increasing. Syngas serves as a vital feedstock for ammonia production, a key component in many fertilizers. Additionally, syngas is essential for producing various chemicals, including methanol, which is used in plastics, solvents, and other industrial applications. The demand for these chemicals is on the rise due to industrial expansion and urbanization. The Indian government is actively encouraging the use of syngas in chemical and fertilizer production as part of its broader strategy to boost agricultural

productivity and ensure food security. This support includes offering incentives for projects that utilize syngas. Furthermore, advancements in production technologies are making it more feasible and cost-effective to convert syngas into a range of chemicals and fertilizers, increasing the attractiveness of this segment for investors.

By integrating syngas production with local agricultural practices, a circular economy can be established, where agricultural waste is transformed into energy and subsequently used for fertilizer production. This approach not only addresses waste management challenges but also supports local farmers and strengthens rural economies. Collectively, these factors position syngas as a crucial element in meeting both energy and agricultural needs in India, facilitating significant market growth.

Regional Insights

Based on Region, West India emerged as the dominant region in the Indian market for Syngas in 2024. Western India, particularly in states like Gujarat and Maharashtra, hosts a wide variety of industries, including chemicals, petrochemicals, and fertilizers, all of which significantly depend on syngas for their production processes. This reliance drives demand within the region. Furthermore, the area boasts a well-established infrastructure, featuring extensive natural gas pipelines and distribution networks, which streamlines the sourcing of feedstock for syngas production and minimizes logistical challenges and costs.

State governments in Western India have actively implemented policies and initiatives to promote clean energy and syngas projects. These efforts include providing financial incentives, subsidies, and regulatory support that encourage investments in syngas production facilities. Additionally, the region has access to substantial natural gas reserves and agricultural feedstocks, enabling companies to produce syngas efficiently and at competitive costs.

Western India is also a center for innovation in energy technologies, including gasification and syngas production. Collaborations between research institutions and industries focus on developing more efficient production methods, which enhance the overall competitiveness of syngas. The strong demand for fertilizers in agriculture fuels the need for syngas in ammonia production, with the region's agricultural output further bolstering this demand and creating a stable market for syngas-based products.

The favorable combination of supportive policies, robust infrastructure, and consistent market demand attracts both domestic and international investments in syngas projects. This influx of investment aids in the development of new facilities and technologies, further solidifying the market's growth.

Key Market Players

- Linde India Limited
- Air Products and Chemicals Inc.
- Air Liquide India
- Alchemie Gases & Chemicals Pvt. Ltd.
- Enerkem India Pvt. Ltd.
- Chembond Chemicals Limited
- Clarke Energy India Private Limited
- Topsoe India Pvt. Ltd.
- New Era Cleantech Solution Private Limited
- Coal India Limited

Report Scope:

In this report, the India Syngas Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

- India Syngas Market, By Production Technology:
  - Steam Reforming
  - Partial Oxidation
  - Autothermal Reforming
  - Biomass Gasification
  - Others
- India Syngas Market, By Application:
  - Chemicals & Fertilizer
  - Fuels

o Electricity

India Syngas Market, By Region:

o West India
o North India
o South India
o East India

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the India Syngas Market.

Available Customizations:

India Syngas Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

Table of Contents:

1. Product Overview
1.1. Market Definition
1.2. Scope of the Market
1.2.1. Markets Covered
1.2.2. Years Considered for Study
1.2.3. Key Market Segmentations
2. Research Methodology
2.1. Objective of the Study
2.2. Baseline Methodology
2.3. Key Industry Partners
2.4. Major Association and Secondary Sources
2.5. Forecasting Methodology
2.6. Data Triangulation & Validation
2.7. Assumptions and Limitations
3. Executive Summary
3.1. Overview of the Market
3.2. Overview of Key Market Segmentations
3.3. Overview of Key Market Players
3.4. Overview of Key Regions/Countries
3.5. Overview of Market Drivers, Challenges, and Trends
4. Impact of COVID-19 on India Syngas Market
5. India Syngas Market Outlook
5.1. Market Size & Forecast
5.1.1. By Value & Volume
5.2. Market Share & Forecast
5.2.1. By Production Technology (Steam Reforming, Partial Oxidation, Autothermal Reforming, Biomass Gasification, Others)
5.2.2. By Application (Chemicals & Fertilizer, Fuels, Electricity)
5.2.3. By Region (North, South, East, West)
5.2.4. By Company (2024)
5.3. Product Market Map
6. North India Syngas Market Outlook
6.1. Market Size & Forecast

6.1.1. By Value & Volume
6.2. Market Share & Forecast
6.2.1. By Production Technology
6.2.2. By Application
7. South India Syngas Market Outlook
7.1. Market Size & Forecast
7.1.1. By Value & Volume
7.2. Market Share & Forecast
7.2.1. By Production Technology
7.2.2. By Application
8. East India Syngas Market Outlook
8.1. Market Size & Forecast
8.1.1. By Value & Volume
8.2. Market Share & Forecast
8.2.1. By Production Technology
8.2.2. By Application
9. West India Syngas Market Outlook
9.1. Market Size & Forecast
9.1.1. By Value & Volume
9.2. Market Share & Forecast
9.2.1. By Production Technology
9.2.2. By Application
10. Market Dynamics
10.1. Drivers
10.2. Challenges
11. Market Trends & Developments
11.1. Merger & Acquisition
11.2. Product Development
11.3. Recent Developments
12. Porters Five Forces Analysis
12.1. Competition in the Industry
12.2. Potential of New Entrants
12.3. Power of Suppliers
12.4. Power of Customers
12.5. Threat of Substitute Products
13. Policy & Regulatory Framework
14. India Economic Profile
15. Competitive Landscape
15.1. Linde India Limited
15.1.1. Business Overview
15.1.2. Company Snapshot
15.1.3. Products & Services
15.1.4. Financials (As Reported)
15.1.5. Recent Developments
15.1.6. SWOT Analysis
15.2. Air Products and Chemicals Inc.
15.3. Air Liquide India

15.4. Alchemie Gases & Chemicals Pvt. Ltd.
15.5. Enerkem India Pvt. Ltd.
15.6. Chembond Chemicals Limited
15.7. Clarke Energy India Private Limited
15.8. Topsoe India Pvt. Ltd.
15.9. New Era Cleantech Solution Private Limited
15.10. Coal India Limited
16. Strategic Recommendations
17. About us and Disclaimer

India Syngas Market By Production Technology (Steam Reforming, Partial Oxidation, Autothermal Reforming, Biomass Gasification, Others), By Application (Chemicals & Fertilizer, Fuels, Electricity), By Region, Competition, Forecast and Opportunities, 2020-2030F

Market Report | 2024-11-30 | 85 pages | TechSci Research

To place an Order with Scotts International:

- - Print this form
- - Complete the relevant blank fields and sign
- - Send as a scanned email to support@scotts-international.com

ORDER FORM:

Select license	License	Price
	Single User License	$3500.00
	Multi-User License	$4500.00
	Custom Research License	$7000.00
	VAT	
	Total	

*Please circle the relevant license option. For any questions please contact support@scotts-international.com or 0048 603 394 346.

** VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*		Phone*	
First Name*		Last Name*	
Job title*			
Company Name*		EU Vat / Tax ID / NIP number*	
Address*		City*	
Zip Code*		Country*	

Date	2026-03-04
Signature	