India Biomass Gasification Market Assessment, By Feedstock [Agricultural Waste, Municipal Waste, Animal Waste, Others], By Gasifier Technology [Fixed Bed, Fluidized Bed, Others], By Application [Power Generation, Transportation Fuel, Hydrogen Generation, Others], By Region, Opportunities and Forecast, FY2018-FY2032F

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Report description:

India biomass gasification market is expected to observe a CAGR of 10.79% during the forecast period FY2025-FY2032, rising from USD 46.30 million in FY2024 to USD 105.07 million in FY2032. The market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years.

Biomass gasification has become inevitable in India due to its capability to deliver decentralized and sustainable sources of energy. The process of carrying out the generation of electricity through local agriculture waste ensures reduced reliance on fuel sources, preventing unfavorable environmental consequences. Biomass gasification helps address energy shortages in the country and contributes to waste management, thereby minimizing the emission of greenhouse gases. Moreover, the Indian government is also issuing supportive regulations and policies in order to enhance the utilization of biomass gasification for the production of sustainable gases.

For instance, in May 2022, IEA Bioenergy, announced that the Ministry of New & Renewable Energy (MNRE) has been actively promoting biomass gasification in India, thereby emphasizing its role in sustainable gas production. As per a study conducted by the MNRE, the current availability of biomass residues for gasification in India is estimated at 750 million metric tons per year with surplus availability of about 230 million metric tons per annum, equivalent to a potential of about 28 GW. The main goal of MNRE is to promote the application of biomass gasification for waste management, which shall emphasize the technology's ability to transform organic waste into valuable energy resources in the country.

Continuous Increase in Agricultural Wastes is Augmenting the Market Growth

The demand for biomass gasification in India is rising continuously with the ever-increasing volume of agricultural waste. This, in return, offers a great opportunity for biomass gasification to mitigate energy shortages and environmental hazards. Biomass gasification can efficiently convert agricultural residues into clean gases, contributing to sustainable energy production and decreased GHG emissions. Furthermore, the use of agricultural waste for energy supports local economies and sustainable waste management practices, which perfectly falls under India's expanded renewable energy target.

For instance, in May 2024, the Indian Biogas Association announced that India produces about 990 million metric tons (MMT) of agricultural residues each year. India is an agricultural superpower and uses about 139.3 million hectares of area for farming, by employing 54.6% of its workforce in the sector. This robust agricultural base supports the economy and has a huge potential for biomass gasification, which is key to sustainable energy solutions and the development of clean energy initiatives.

Rise in Investment for Biomass Gasification in Rural Areas Creates Market Opportunity

The demand for biomass gasification is very high in villages, as it is expected to enhance energy access and economic development while promoting environmental sustainability. In rural setups, the contribution of biomass gasification can provide villagers with a good source of clean and reliable energy for cooking, heating, and power production, hence reducing the energy gap in the areas. Moreover, biomass gasifier plants in rural areas utilize agricultural residues and wastes as feedstock for biomass gasification. This, in turn, creates a new income source for the farmers and reduces the environmental hazards of waste disposal.

In February 2022, Biomass Energy for Rural India (BERI) developed a 500 KW biomass gasifier plant in rural Karnataka (Tumakuru district) for developing clean energy by seeking financial assistance from the United Nations Development Programme (UNDP), Innovation for Cool Earth Forum (ICEF), and the government of India. Karnataka has immense potential (about 1000 kilowatts) for the development of biomass gasification plants. Moreover, there are currently 20 biomass power plants in operation across the state.

Rise in the Number of Biomass Gasification Projects is Proliferating Market Growth Significantly

Biomass gasification projects in India are essential for producing environmentally friendly gas, addressing the country's rising fuel costs and reducing dependence on fossil fuels. These plants contribute to waste management by using surplus biomass residues which reduces the use of landfill space and toxic gas emissions. In addition, biomass gasification supports the production of renewable energies to promote a circular economy, which in turn enhances the energy security system within the country.

For instance, in November 2024, Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) announced that there are three biomass gasification projects currently commissioned in Tamil Nadu. One is 9 KW at Odanthurai, another 9 KW unit at Nellithurai, and the highest 40 KW gasifier is located at Kadachanallur. These installations are under an effort to utilize biomass for sustainable gas production, thus contributing toward clean energy solutions in the state. Moreover, the projects reflect Tamil Nadu's commitment to the advancement of renewable energy technologies while reducing fossil fuel reliance to achieve the country's sustainable goals.

North India Emerged as the Market Leader

North India is a leader in biomass gasification mainly due to large agricultural waste production and the availability of ample feedstock resources. Moreover, one of the important reasons behind the lead is Uttar Pradesh with the highest amount of biomass feedstock availability in the country. In 2023, as per Sardar Swaran Singh National Institute of Bioenergy (an autonomous institute of MNRE), Uttar Pradesh led the country with an overall biomass feedstock storage of 124692.8 million tonnes, which covers around 16.52% of the country's total biomass feedstock storage capacity. The huge feedstock storage, in turn, is facilitating the establishment of new biomass gasification projects in the state, thereby promoting sustainable energy production as well as benefiting the local communities.

Supported by government policies, the region's focus on decentralized electrification also addresses the need for rural electrification as well as increasing access to resource availability, support policy, and potential for economic growth. This, in turn, makes North India a prominent region for the development and implementation of biomass gasification technologies, thereby amplifying the market growth.

Future Market Scenario (FY2025 - FY2032)

- The advent of highly advanced biomass gasification technologies in India is crucial for sustainable waste management and clean energy generation. This, in turn, is expected to create ample opportunities for market growth in the future.
- The introduction of new biomass gasification projects is expected to significantly enhance market growth at present and in the

years to come, as these projects are expected to increase the country's biomass gasification capacity by several times.
-Furthermore, the Indian government is promoting biomass gasification through several policy measures which in turn is anticipated to play a huge role in the country's future growth.

Key Players Landscape and Outlook

The market players are continuously competing amongst themselves to secure a significant spot in the market. The country's extensive agricultural waste resources and government support drives companies to invest in innovative technologies and form strategic partnerships to increase efficiency and reduce costs.

The market has many participants, ranging from small local companies to MNCs, all competing for superiority. Government initiatives such as subsidies and incentives stimulate more growth which promotes advancements in biomass gasification technology as well as sustainable energy solutions and efficiently responds to rural energy needs. For example, in November 2022, MNRE sanctioned the Biomass Programme under the Umbrella scheme of the National Bioenergy Programme from FY2021-22 to FY2025-26. The program supports the development of biomass gasification plants across the country. The first phase of the program will be undertaken for USD 101.61 million with central finance assistance (CFA) to make the biomass gasification projects more viable. Furthermore, the program promotes the utilization of biomass residues, such as municipal and agricultural wastes, for gasification, which leads to energy recovery and environmental sustainability in India.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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