

Design of 2 TPD Rotary Kiln Gasification Pilot Plant with high CV syngas production

The Department of Mechanical Engineering is involved in the waste to energy project in collaboration with DST. Karunya has recently obtained funding of INR 6.12 crores from Department of Science and Technology, Government of India for a research project titled “Design of 2 TPD Rotary Kiln Gasification Pilot Plant with high CV syngas production”. This project is being done in collaboration with an industry partner Techurja Inc., Bangalore and the Central Mechanical Engineering Research Institute, Durgapur. The total cost of the project is INR 7.5 crores including the contributions from Karunya and the industry partner.

In the last two decades of industrialization and opening of markets the quantity of industrial wastes also has increased exponentially. As per the National Master Plan for Development of Waste to Energy in India, approximately 2,00,000 tonnes of municipal solid waste MSW is generated in India every day. The Swachh Bharat Mission of the Government of India was created specifically to address this major problem of waste management in an expeditious manner. According to reports published by the mission, only 15% of the solid waste in the country is properly processed.

The growth in the amount of municipal solid-waste generation poses many threats to the environment and occupational health. Disposal of waste in low-lying areas without proper liners, leachate collection, or treatment systems, creates groundwater pollution, generation of greenhouse gases from landfills, and provides a conducive atmosphere for the growth of many disease vectors. The conversion of waste to energy addresses the waste management issue in a fairly comprehensive manner.

This proposal envisages a Waste-to-Energy (WTE) plant with a unique feature of disposing plastic waste, which will serve as a model plant for municipalities and industries. The project will demonstrate a working model for industries/ governments and would be an opportunity for the stakeholders to understand how their plastic waste can be disposed in an environmentally friendly manner while producing energy, which will partially offset the cost of waste management.

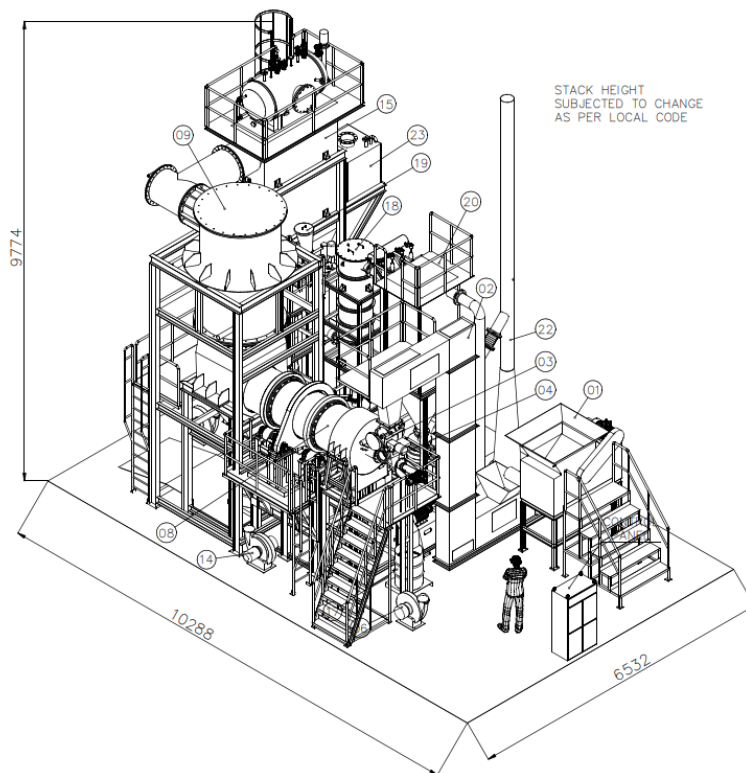
Gasification is the appropriate technology for WTE plants up to to 500 TPD of Municipal Solid Waste. The Ministry of New and Renewable Energy resources also in their recent letter have requested the Department of Science and Technology to develop gasification technologies. There are more than 600 cities in India where waste management can be addressed with gasification, with waste generation of 5 to 500 TPD

Karunya as a premier institute of technology in the country has a vision to be the leader in technology development for responsible disposal of waste. This project is an opportunity and a responsibility of Karunya to respond to this human resource and technology challenge, to implement the first installation and demonstrate the concept for the local industrial clusters and municipalities.

This facility could be used to evaluate the potential energy production from various waste streams by various industries. There is a serious shortage of trained human resources in this area, and as a consequence of the project, Karunya will develop faculty and trained manpower in the areas of waste management and WTE conversion.

The project creates opportunities for Karunya to enhance R&D activities on WTE conversion, gasification technologies and renewable/alternative energy. Thus, Karunya will spearhead a solution to a social and environmental problem plaguing the whole country, build confidence and be a trendsetter in establishing a Clean and Green Technology in the WTE business, create many new jobs while assuring economic disposal of non-biodegradable solid waste.

The Principal Investigator of the project is Professor Madhu Ganesh, an engineer with 34 years of industrial and academic experience in India and the USA. Prof. Madhu has been involved in the design, installation and commissioning of five such projects in India and USA. The co-investigators in the project are Assistant Professor Joseph John Marshal of Karunya and Mr. Partha Das of CMERI.



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