

and then mixed with septage to form a slurry. The slurry is continuously agitated and forwarded to the digester. Option of pasteurization of septage using excess heat is kept open for further use of excess digest-ate to produce organic fertiliser.

- The co-fermentation process takes place in the bio-digester producing approx. 2,500m<sup>3</sup> biogas per day.
- After purification and reduction of moisture the gas is sent to a Combined Heat and Power (CHP) unit, where power of minimum 3,300 kWh/day is generated.
- The generated power will be feed into the power grid.
- The nutrient-rich effluent from the earlier treated septage can be used as moisturizing agent in the composting process in the existing compost plant, thus closing the loop of recycling and reusing waste.



## Business Model

The project is implemented in DFBOOT mode. The private player selected in a competitive bidding process is responsible for the design construction and operation and maintenance of the plant for a period of 10 years. The private company is also responsible for assuring the collection and transportation of sufficient waste material to the plant. The monthly investment required from NMC for operation and maintenance and collection and transportation of waste is of INR 5 lakh. In return the plant operator will guarantee the supply of daily minimum of 3,300 kWh electricity to the Maharashtra Power Grid, which will be accessible for NMC free of cost.

The project was designed and implemented in cooperation with Deutsche Gesellschaft fuer Internationale Zusammenarbeit on behalf of the Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BmUB) of Germany as part of its international climate initiative.

In India the project is being implemented on behalf of Ministry of Environment and Climate Change, Government of India, under the Indo-German Cooperation.

## About GIZ

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is a global service provider in the field of international cooperation for sustainable development with around 16,400 employees. GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment, energy and the environment, and peace and security. GIZ works together with its partners to develop effective solutions that offer people better prospects and sustainably improve their living conditions.

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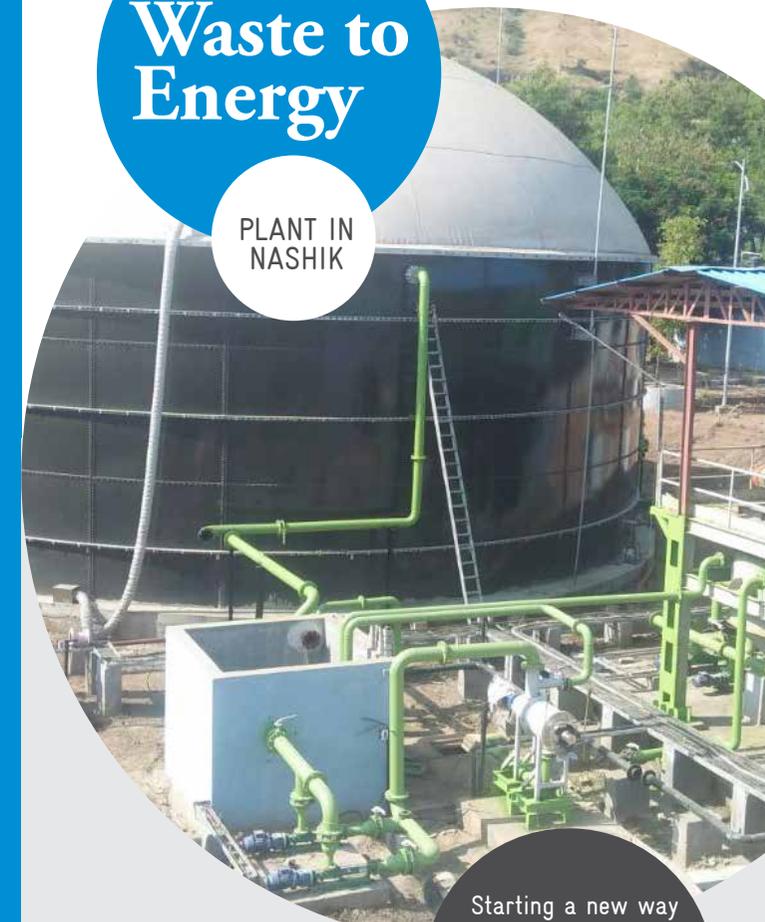
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# Waste to Energy

PLANT IN NASHIK



Starting a new way to produce energy from combined waste of Septage and Biodegradable urban waste

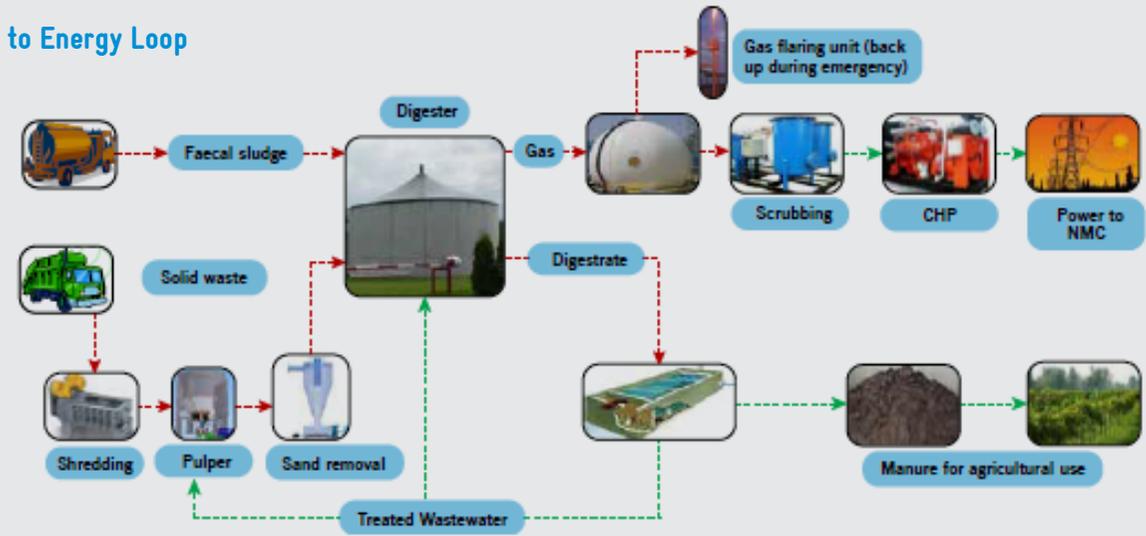
# Waste to Energy



Like many cities in India, the city of Nashik is also struggling with citywide Solid Waste and Wastewater management. Therefore, there is an urgent need for an integrated approach to solid waste and wastewater management on the one hand and control of Green House Gas (GHG) emissions on the other hand. The Waste to Energy Project in Nashik is one such solution through co-processing of septage (faecal sludge) with organic solid waste and generating energy to create a sustainable business model.

This project is an attempt to showcase a viable business model for implementation of waste to energy projects through a Public Private Partnership (PPP) and is built on a comprehensive financial and operational model. The plant is planned to treat biodegradable waste and septage generated in the city and generate energy through biogas for feeding it into the Maharashtra power grid.

## Waste to Energy Loop



The project in Nashik opens possibilities to develop and replicate sustainable Waste to Energy technology with the potential of reducing investment costs for the public sector and to achieve sustainability in operation. The project closes the loops by creating additional benefits like reduction of carbon footprint and resource efficiency, which for India is of rising economic and environmental importance.

### How the plant works: Technical approach

The participatory process ensures involvement of all stakeholders - Nashik Municipal Corporation (NMC), public representatives, the hotel industry, technical experts and engineers.

- Daily 10 to 15 tons of food and vegetable waste from approximately 500 restaurants and 10 to 20 tons of septage from 400 community toilets are collected by trucks and delivered to the plant. The organic waste from hotels is segregated at the collection points.
- In a first step, organic waste and septage will be treated separately. The organic waste will once more be cleared from any foreign matter, fed to a crusher

### FACTS & FIGURES



10 tons of organic waste and 20 tons of Septage



Generation of 3,300 kWh per day to be fed into Maharashtra power grid



The project is implemented in DFBOOT (Design - Finance - Build - Own - Operate - Transfer) mode.



PPP Model with monthly costs for Nashik Municipal Corporation of 5 lakh INR

