



IBG-Plus
Single Stage Biomethanation

IBG-Plus

Single-Stage Biomethanation Technology

The global economic development in the 20th century has led to extensive use of fossil fuels thus causing enormous emissions of greenhouse gases such as carbon dioxide. Organic wastes also generate large amount of methane as they decompose. Increase in concentration of both carbon dioxide and methane in the atmosphere causes global warming. Therefore, there is a thrust globally on reduction of fossil usage fuels and increasing the organic waste conversion to fuels.

IndianOil R&D has developed a single-stage anaerobic digestion technology, IBG-Plus, for conversion of all types of organic waste to biogas through use of enviro-tolerant inoculants and an innovative biodigester design. This technology is feed agnostic and suitable for any kind of organic waste containing biodegradable material. IBG-Plus technology has been validated for almost all types of organic wastes including agricultural residues like paddy straw, wheat straw, bagasse, etc. The IBG-Plus technology employs feedstock pre-treatment followed by digestion in presence of proprietary inoculant leading to low Hydraulic Residence Time (HRT) and high biogas yield.



Salient Features

- High biogas yield with higher methane content (> 70%)
- In situ conversion of CO₂ to Methane
- Proprietary enviro-tolerant, feed agnostic inoculants work efficiently at wide range of temperature and salinity
- Waste to biogas conversion efficiency is 1.5 times higher than conventional technologies



IBG-Plus

Single Stage Biomethanation

Major Benefits

- Low HRT and low CAPEX due to reduced reactor size
- Low purification cost & less footprint area
- Generated manure can be utilised as bio-fertilizer



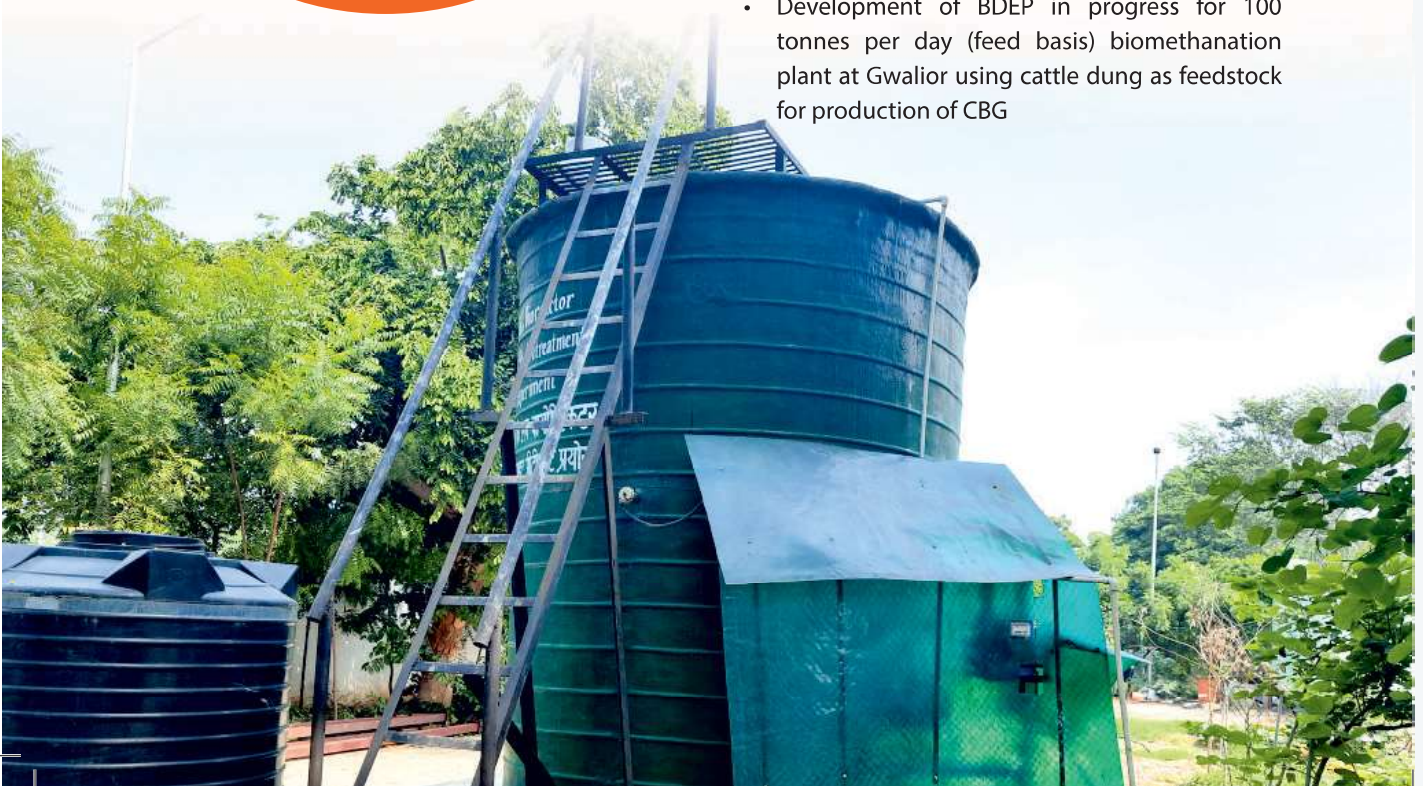
Commercial Experience

Commissioned Units

- IBG-Plus technology has been successfully piloted at IndianOil R&D
- Successfully implemented at following locations through use of proprietary microbial inoculant
 - ▶ Single-stage biomethanation plant of 5 tonnes per day at Varanasi, Uttar Pradesh
 - ▶ 240 tonnes per day biomethanation plant at Namakkal, Tamil Nadu based on press mud, chicken litter and MSW, resulting in higher biogas yield (~30%) with higher methane content (~ 15%) in the biogas

Upcoming Units

- 200 tonnes per day (feed basis) biomethanation plant at Gorakhpur, UP based on IBG-Plus technology using paddy straw as feedstock for production of Compressed Bio Gas (CBG) - commissioning scheduled in 2022-23
- Development of BDEP in progress for 100 tonnes per day (feed basis) biomethanation plant at Gwalior using cattle dung as feedstock for production of CBG





IBG-Max
Two Stage Biomethanation

IBG-Max

Two-Stage Biomethanation Technology

The global economic development in the 20th century has led to extensive use of fossil fuels thus causing enormous emissions of greenhouse gases such as carbon dioxide. Organic wastes also generate large amounts of methane as they decompose. Increase in concentration of both carbon dioxide and methane in the atmosphere causes global warming. Therefore, there is a thrust globally on reduction of fossil fuels usage and increasing conversion of organic waste to fuels.

IndianOil R&D has developed a two-stage anaerobic digestion technology, IBG-Max, for conversion of all types of organic waste (except agricultural residues) to biogas through the usage of proprietary inoculants and innovative biodigester design.

IBG-Max technology has been validated for most of the organic wastes such as food waste (both pre-cooked and leftovers) from various sources like food processing industries, households and hospitality sector, animal waste (cattle dung and poultry droppings, etc.), dairy waste, organic fraction of Municipal Solid Waste (MSW), Press Mud, STP waste water/sludge etc. The technology employs extraction of biodegradable organic fraction from waste as acid intermediates using optimised microbes in the first stage; while in the second stage, the acid intermediates from the first stage are converted into biogas using proprietary inoculants.



Salient Features

- High biogas yield with higher methane content (> 80%)
- In situ conversion of CO₂ to methane
- Proprietary enviro-tolerant, feed agnostic inoculants work efficiently at wide range of temperature and salinity
- Waste to biogas conversion efficiency is 1.5-2.0 times higher than conventional technologies



IBG-Max

Two Stage Biomethanation

Major Benefits

- Low HRT and low Capex due to low-capacity reactors
- Low purification cost & less footprint area
- Generated manure can be utilised as bio-fertiliser

Commercial Experience

Commissioned Units

- A 5 tonnes per day biomethanation plant based on IBG-Max technology is operational at IndianOil's R&D Centre at Faridabad, using MSW as feedstock, meeting biogas yield and methane content against design value
- 100 tonnes per day biomethanation plant at Jaipur, Rajasthan based on two stage IBG-Max technology using cattle dung as feedstock commissioned in July, 2022 producing Compressed Bio Gas (CBG) meeting IS specification

Upcoming Units

- Setting up of plant with capacity to process 135 tonnes per day of cattle dung is under process at Shri Mataji Gaushala, Barsana, Uttar Pradesh

