



**IBG-Plus**  
Single Stage Biomethanation

# IBG-Plus

## Single-Stage Biomethanation Technology

The global economic development in the 20<sup>th</sup> century has led to extensive use of fossil fuels thus causing enormous emissions of greenhouse gases like 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 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 Technology Features

High biogas yield with higher methane content (> 70%)

In-situ conversion of CO<sub>2</sub> 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



## 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

- IBG-Plus technology has been successfully piloted at IndianOil R&D Centre
- IBG-Plus technology successfully implemented at following locations through use of proprietary microbial inoculant
  - Single-stage biomethanation plant of 5 tones per day at Varanasi, Uttar Pradesh
  - 240 tones 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 tones 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



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**IBG-Max**  
Two Stage Biomethanation

# IBG-Max

## Two-Stage Biomethanation Technology

The global economic development in the 20<sup>th</sup> century has led to extensive use of fossil fuels thus causing enormous emissions of greenhouse gases like 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 Technology Features

High biogas yield with higher methane content (> 80%)

In-situ conversion of CO<sub>2</sub> 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



## 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

- 5 tones per day biomethanation plant based on IBG-Max technology is operational at IndianOil's R&D Centre Faridabad, using MSW as feedstock, meeting biogas yield and methane content against design value

## Upcoming units

- A 100 tones per day biomethanation plant at Jaipur, Rajasthan based on two stage IBG-Max technology using cattle dung as feedstock for generation of Compressed Bio Gas (CBG) – commissioning scheduled by 2021
- Setting up of another plant with capacity to process 135 tonnes per day of cattle dung is under process at Shri Mataji Gaushala, Barsana, Uttar Pradesh



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