



Integrated Waste Management with Decentralized Approach Case Study – Indore , (M.P.)



Bio- CNG plant from segregated wet waste at Indore

Swachh Survekshan Award
2017



Swachh Survekshan Award 2018



Swachh Survekshan Award 2019



Indore has been declared Cleanest city of India in last three
Swachhata Survekshan

Integrated Solid Waste Management



Key to Success – 100% Door to Door Collection with 100% Segregation



Wet Waste

Dry Waste

Sanitary & Domestic Hazardous Waste

Ultra Modern Mechanized Transfer Stations



10
Ultra Modern
Mechanized Transfer
Stations



ISO CERTIFICATE - Disposal site Devguradiya



- IMC has obtained ISO 9001:2015, ISO 14001: 2015, OHSAS 18000:2007 for Segregation, Collection, Transportation & Disposal of Solid Waste.



Certificate of Registration

This is to certify that the Environmental Management System of
DEVGURADIYA TRENCHING GROUND MUNICIPAL CORPORATION INDORE
 Devguradiya, Indore-452001(M.P.) (India)

Has been successfully assessed & conforms with the following standard

ISO 14001:2015

Scope of Certification
 Collection Transportation Segregation & Disposal of Solid Waste Including Cleanliness with Operation of Compost Plant and Recycling of Segregated Waste Material

Certificate No.: SMS/QMS/A10/0010

Initial Registration Date : 29-03-2018 Issue Date : 29-03-2018
 Surveillance 1 Audit Date : 29-12-2018 Expiry Date : 29-03-2021
 Surveillance 2 Audit Date : 29-12-2019

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 31 C, Conna, Sector 10, Gurgaon, Haryana
 To Check Certification Status: www.uafcertification.org

Signature of Director

SALARA MANAGEMENT SYSTEM PRIVATE LIMITED
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THE VALIDITY OF CERTIFICATE IS SUBJECT TO REGULAR SURVEILLANCE MUST CONDUCT REGULAR MONITORING AND REPORTING TO THE ACCREDITING SUPERVISOR



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Decentralized Processing – 150 TPD



Decentralized Organic Waste Processing

238 units

Hotels, Hospitals,
Marriage Gardens,
Schools and Colleges

76 units

Residential Welfare
Associations (RWA's)

386 units

City Gardens covering all
586 developed gardens

5 TPD

Capacity mobile
decentralized composting
unit

30000 units

Home Composting
Bins



Hon'ble Mayor and IMC
Commissioner at RWA Talk show



RWAs Bulk Garbage generators
practicing Onsite processing



Mobile Composter

Bio-CNG Plant at Choithram Mandi



20 TPD

Biomethanation Plant at Choithram Mandi



- IMC has successfully demonstrated 20 TPD Bio CNG plant at Choithram mandi.
- This plant was installed in the year 2017
- Clean upgraded biogas can be used as fuel for automobiles
- Today, 15 buses in Indore are running on the Bio-CNG since last 2 years
- These busses consume nearly 1400 kg of bio CNG gas per day & running more than 3000 km per day.

Bio-CNG Plant at Kabit Kheri



With the success of plant at Choithram Mandi IMC has installed another plant at Kabitkheri of 15 TPD capacity in 2019.

This innovation is not only creating a cleaner world with green fuel but also rise life of citizens in the city.

The innovation provides green and cheap energy & much needed organic fertilizer, is a true example of Circular Economy.

The success of these plants are because of the 100% segregation achieved at Indore.

We are now coming up with 200TPD Bio CNG plant. All the city buses will run on the Bio-CNG after installation of this plant.

15 TPD

Bio-methanation Plant at Kabitkheri



Bio-CNG plant at
Kabitkheri

Advantages of Anaerobic Digestion / Biomethanation



- **Biogas is Eco-Friendly** - Biogas is a renewable, as well as a clean, source of energy. Gas generated through bio digestion is non-polluting; it actually reduces greenhouse emissions
- **Biogas Generation Reduces Soil and Water Pollution** - In biogas generation there is no spillage of water or effluent. It is a closed process which in turn, leads to improvements in the environment, sanitation, and hygiene.
- **Reduction of land requirement** for MSW disposal.
- By Biomethanation of organic waste no landfilling is required hence we can **avoid emissions from landfills**
- Production of **stabilized soil conditioner** sludge can be used as **soil conditioner** in the agriculture field.
- Energy generation which **reduce operational cost**.

Bio-CNG Plant



Capacity : 20 TPD organic green waste

Digesters: The digestion capacity of the installed biogas plant is 20 tons/day. Gas production capacity: Around 1600 cum of raw biogas daily.

Cleaning of gas : Enriched to meet the gas quality equivalent to the standards specified by BIS (IS:16087 2016).

Final output: Bio-CNG 700 kgs/ day.

Organic Manure: 6 tons/day

Feeding Mechanism



The wet waste which is generated from the vegetable wholesale market(mandis), hotels and schools and from the bulk generators is brought to the bio-methanation plant and is kept on the feeding area.



Digester



- Under anaerobic conditions, temperature around 35°C and a continuous mixing, biogas is being produced by the conversion of the dissolved organic matters.
- Daily feeding capacity of 20 Tons.



Biogas Enrichment



The digestion capacity of the installed biogas plant is 20 tons/day. The organic manure production from the plant is around 3 tons/day. The plant produces around 2000m³ / day of raw biogas. The raw biogas is further enriched to meet the gas quality which is equivalent to the standards specified by **BIS (IS: 16087 2016)**.

Purified Gas Storage Balloon and Cascade Gas storage



- A Bio-CNG Storage Balloon, which is collapsible and intermediate storage tank for bio-CNG prior to the application or before compressor.
- The standard Industrial grade cylinders certified by PESO were installed for gas storage. At present there are three cascade are installed at the site

Bio-CNG Dispensing Unit



The present installed dispenser is Parker make dispenser designed for Hazardous area under class I, DIV I, Group IIA & IIB. It meets statutory regulations on safety of vehicle being filled.





Proposed 200 TPD Bio CNG plant

- It is a new initiative taken up by Indore Municipal Corporation to produce and utilize Bio CNG produced from processing of Municipal Solid Waste.
- The proposed project is of 200 TPD capacity organic waste. It will address to present and future requirement of organic waste processing in Indore.
- Where as Biomethanation is a closed process and there is nil emission from the process.
- The Biomethanation plant is anaerobic digestion process, which takes place in a closed airtight digester where organic raw materials are converted into biogas and digestate as products.
- The biogas project provide greener fuel with zero discharge.
- Bio CNG gas specifications are as per latest Indian Standard Norms and the gas is suitable to fill in the gas cylinders as per PESO Gas Cylinder Regulations.

Advantages of setting up of 200 TPD Bio CNG plant at Indore

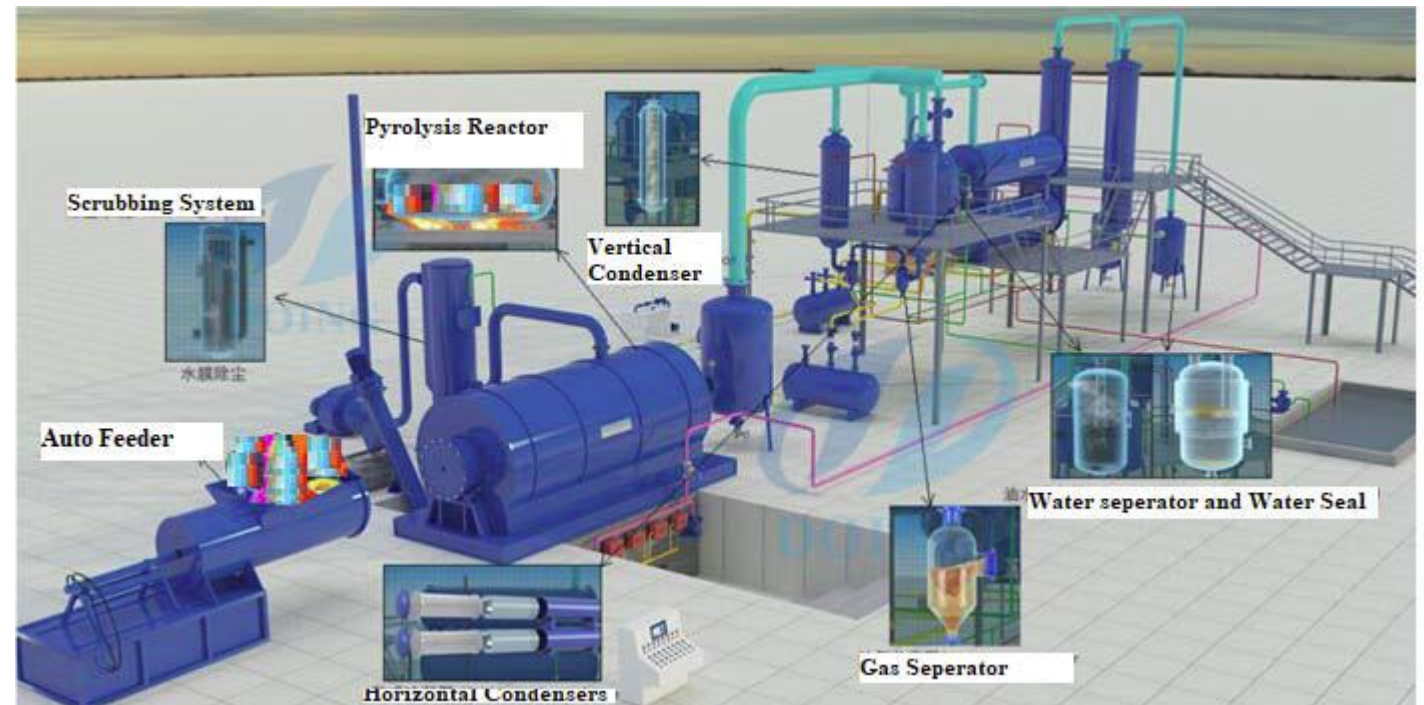


- Indore has 100% segregation of waste.
- Biomethanation is only successful if segregated waste is provide to the plant. Hence the committed gas generation in Indore is achievable which makes the project feasible.
- With installation of this plant all the city busses can operate on the produced Bio CNG.
- IMC/AICTSL will get Bio CNG at lower price than the market price. AICTSL will get the fuel at lesser cost and since it is green fuel it has lesser emissions.
- IMC will get 40 TPD high quality compost.
- Since Indore has 100% segregation of waste, the best companies will be eager to bid for the project in Indore.
- The estimated cost of the project is 80.00CR. IMC proposes to install this plant on PPP basis.

Plastic to Diesel Plant



- ▶ Plastic to diesel Plant of 8 TPD Capacity wherein IMC process raw plastic that generates 3000lt crude oil from which 2600lt diesel, 180lt petrol, 200-300 kg carbon black is being obtained on



Bioremediation - Transformational Change



BEFORE



BEFORE



PRESENT



- ▶ 100 % legacy waste remediated
- ▶ 100 acres land worth Rs. 300 cr. Reclaimed
- ▶ The area is being converted to city forest. Dense plantation with 30000 Plants has been done

Thank You