

PROJECT REPORT



ENVIRONMENTAL MANAGEMENT PLAN

FOR

PROPOSED COMPRESSED BIO-GAS (CBG) PROJECT
OF 6 TPD CAPACITY

AT :

GANESHPUR, P.O. PARORA, DIST. PURNIA (BIHAR)

BY

EASTERN INDIA BIO-FUEL PVT. LTD.
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Prepared by :-



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1.0 EXECUTIVE SUMMARY :

A. Location:

Eastern India Biofuels Pvt. Ltd. (EIBPL), has established and operating its grain based distillery project with power co generation plant at Ganeshpur, Parora, Block Krityananad Nagar in District Purnia, Bihar having Latitude 25°47'34.48"N & Longitude 87°23'05.11"E at 40 m. above MSL. The Project Site is connected to NH-107 via SH-65 Road. It is about 10 kms. from district head quarter at Purnia and is well connected by NH-107. EIBPL is about 4 Km. (SW) from Krityananad nagar Railway Station on Purnia - Murliganj Meter Gauge Sec. & 14 Km. (W) from Purnia Katihar Broad Gauge Sec. of ECR.

B. General Details:

1. EIBPL has established its Grain Based Distillery of 65 KLD capacity with 2.5 MW Cogeneration Power Plant Project at Ganeshpur, P.O. Parora, Tehsil : Krityanand Nagar, Dist. Prunea in the State of Bihar, after obtaining EC from SEIAA Bihar vide F. No. SIA/5(g)/863/19 Dt: 05.05.2020 followed by Consent to Establish (CTE) vide Memo No. 3387 Dt: 10.08.2020 and CTO under The Air Act'1981 granted by BSPCB vide Ref. No. 630 & and under The Water Act'1974 vide Ref. No. 631 Dt: 25.02.2022 from Bihar State Pollution Control Board (BSPCB).
2. To meet the demand supply gap of EBP, as per guidelines of MoEFCC, Govt. of India vide Gazette Notification S.O. 980 (E), Dt: 02.03.2021(Amendment in EIA Notification 2006) EIBPL has obtained approval from BSPCB under No Increase in Pollution Load for expansion of project from 65 KLD to 100 KLD vide Ref. No. 834 Dt: 12.04.2023 followed by Consent to Establish (CTE) vide Memo No. 966 Dt: 09.06.2023 and CTO (CCA) vide Ref. No. 536 Dt: 27.02.2024, which is valid upto 26.02.2029. NOC from CGWB has been obtained for withdrawal of 560 m3/day ground water vide NOC No. CGWA/NOC/IND/REN/1/2025/11156, valid upto 09.08.2027.
3. At present EIBPL is operating 100 KLPD grain-based distillery (for production of Ethanol) with 2.5 MW Cogeneration power plant.

4. **EIBPL intends to diversify its project for production of Compressed Bio Gas (CBG) by utilizing thin slop generated in its own distillery project as primary feed stock.**
5. With stable ethanol operations and consistent effluent generation, the company now proposes to integrate a Compressed Bio-Gas (CBG) plant of 6 TPD capacity to monetize organic residues and improve environmental sustainability.
6. Currently, EIBPL processes broken rice (surplus FCI rice) and maize as the primary feedstock through a multi-stage process involving liquefaction, fermentation, distillation, and dehydration.
7. It is proposed that Thin slop, piped directly via a 450-metre stainless steel line, serves as the CBG's primary liquid feedstock, eliminating disposal challenges and achieving zero liquid discharge compliance under Central Pollution Control Board (CPCB) guidelines.
8. This integration minimizes transport costs, utilizes shared utilities - e.g., Water and Power. Company will also enter into Offtake arrangement through Tripartite Agreement (TPA) with GAIL and Indian Oil Corporation Limited (IOCL) ensuring revenue stability, while fertilizer by-products support local agriculture
9. Overall, this linkage enhances EIBPL's resilience, with the CBG plant mitigating ethanol's effluent risks and contributing to a circular economy model.
10. The proposed 6 TPD CBG Project is supported by robust ecosystem of central and state-level incentives. The important central support is the Central Financial Assistance (CFA) under the Waste to Energy Programme of the Ministry of New and Renewable Energy (MNRE), for BioCNG/CBG projects, CFA is capacity-linked at Rs 4.0 crore per 4,800 kg/day for new plants, with a maximum cap of Rs 10 crore per project.
11. Under Bihar State Biofuels Production Promotion Policy, 2023, among other benefits, company is eligible for Subsidy on cost of plant and machinery for

biofuels/CBG projects, 15% of cost or Rs 5 crore (whichever lower) and Interest Subvention Incentive at 10% of Term loan for a period of five years.

12. The proposed CBG facility has been configured as a **multi-feed biomethanation system** designed to generate 6 TPD of Compressed Bio-Gas by utilizing a combination of **thin slop** from the 100 KLPD existing ethanol plant along with supplementary agricultural residues such as **maize stalk, corn cob, paddy straw, and cow dung**.
13. For proposed change in product mix due to new CBG plant of 6 TPD capacity, no addition or alteration is required in Boiler, Turbine Generator or other utilities like water, DM water and Ethanol/ Spirit and Raw material storage. Existing, AFBC boiler of 25 TPH capacity based on Rice Husk / Coal as fuel will meet the steam requirement of new CBG plant. Steam requirement of Ethanol Plant is 21 TPH and for proposed CBG plant steam requirement will be 2 TPH. In total 23 TPH steam is required for overall EIBPL project which will be met through existing 25 TPH boiler.

C. Manufacturing & Production Details;

Project Description	Existing Scenario	Proposed Scenario	Final Production
Grain Based Distillery Unit and Cogeneration Power Plant	100 KLPD Grain-based Distillery (Ethanol) plant and 2.5 MW Captive Power Plant	NA	100 KLPD Ethanol and 2.5 MW Power Cogeneration
Compressed Biogas Plant	NA	6 TPD	6 TPD Compressed Biogas

Raw Material Requirement ;

Item	Raw Material Requirement
Thin Slop (Primary raw material)	550 m ³ /day
Agricultural residues such as maize stalk, corn cob, paddy straw, and cow dung (Secondary raw material)	25 MT/Day

D. Pollution Control Measures:

The proposed CBG project will be based on "Zero Liquid Discharge". Fresh water requirement of the project will be met by Ground Water. Efforts will be made to conserve as much water as possible by recycling and reuse.

Waste Water Generation & Treatment ;

From CBG plant primarily liquid digestate (liquid manure), along with smaller amounts of condensate will be generated, which will be subsequently dried in dryer to produce bio manure. These byproducts are generally rich in nutrients and are processed into organic bio-manure within project premises.

Air Pollution :

For proposed change in product mix due to new CBG plant of 6 TPD capacity, no addition or alteration is required in Boiler, Turbine Generator or other utilities like water, DM water and Ethanol/ Spirit and Raw material storage. Existing, AFBC boiler of 25 TPH capacity based on Rice Husk / Coal as fuel will meet the steam requirement of new CBG plant. Steam requirement of Ethanol Plant is 21 TPH and for proposed CBG plant steam requirement will be 2 TPH. In total 23 TPH steam is required for overall EIBPL project which will be met through existing 25 TPH boiler.

To prevent & control of emission from proposed CBG plant Membrane type CO₂ Scrubber, H₂S scrubber will be installed.

Solid Waste Management:

Solid waste	Quantity	Disposal
Fermented Organic residue	0.9 TPD	Bio Fertilizer

Project Cost :

Total cost of the proposed CBG project of EIBPL is estimated to be Rs. 5899 Lacs (Rs. 58.99 Crores).

PROJECT DETAILS

2.0 INTRODUCTION OF THE PROJECT/BACKGROUND INFORMATION :

(i) Identification of Project & Project Proponent

Anchit Verma

Director

EASTERN INDIA BIO-FUELS PVT. LTD.

W-99, 02ND FLOOR

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Location of the Project :

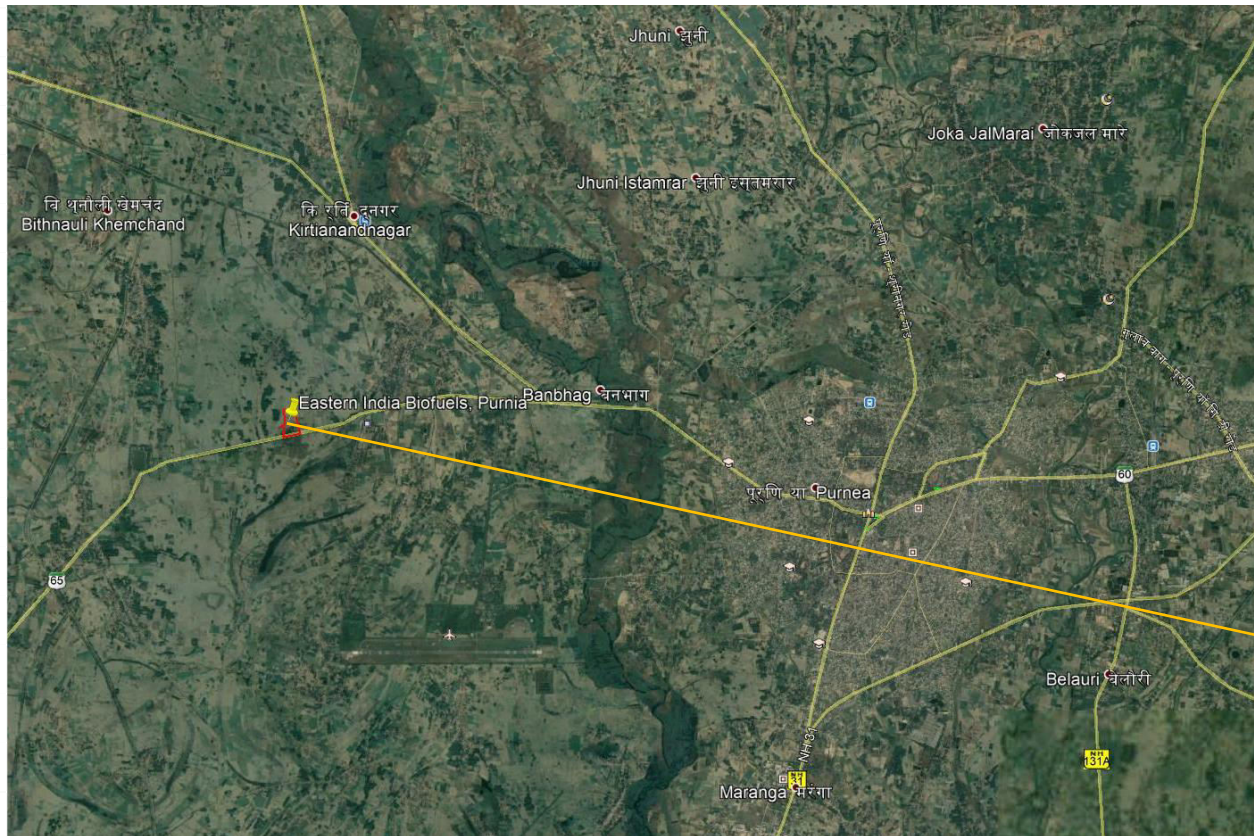
Eastern India Biofuels Pvt. Ltd. (EIBPL) is operating its grain based distillery with cogeneration power plant at Ganeshpur, P.O. Parora, Tehsil: Krityanand Nagar, Dist: Purnea in the State of Bihar (Latitude 25°47'34.48"N & Longitude 87°23'5.11"E).

(ii) Brief description of nature of project :

A Compressed Biogas (CBG) project is a **waste-to-energy initiative** that converts organic waste materials into a high-purity, renewable gaseous fuel, similar in composition and calorific value to Compressed Natural Gas (CNG). These projects typically operate under a circular economy model, solving waste management issues while generating clean energy and organic fertilizer.

CBG is produced through **anaerobic digestion** (decomposition of organic matter by microorganisms in the absence of oxygen). Key feedstocks include agricultural residues (paddy straw), cattle dung, municipal solid waste (MSW), sugarcane press mud, and distillery waste. Raw biogas (55–60% methane) is purified to remove impurities like hydrogen sulfide (H₂S), carbon dioxide (CO₂), and moisture to achieve a methane content of over 90%. This purified gas is then compressed to high pressure (200-250 bar) for storage and transportation.

PROJECT LOCATION MAP



3.0 **Need for the project and its importance to the country and or region**

Compressed Biogas (CBG) projects are essential to India's "waste-to-wealth" vision, aiming to transform organic waste into renewable fuel while boosting rural economies, reducing environmental pollution, and enhancing energy security. The Government of India, under the **SATAT** (Sustainable Alternative Towards Affordable Transportation) scheme, plans to roll out 5,000 CBG plants by 2025–26 to produce 15 MMT of CBG annually, replacing imported fossil fuels and supporting net-zero goals.

The urgency for CBG projects stems from a combination of environmental necessity and energy dependence challenges:

- **Abundant Feedstock Generation:** India generates over 62 MMT of organic waste annually—including agricultural residue, cattle dung, municipal solid waste (MSW), and industrial waste (like sugarcane press mud)—which often causes pollution through mismanagement.
- **High Import Dependency:** India currently imports nearly 50% of its natural gas requirement. CBG offers a domestic alternative, reducing dependence on imports.
- **Environmental Pollution & Stubble Burning:** Unused biomass, particularly paddy stubble, is frequently burned, leading to severe air pollution. CBG projects provide a productive use for this residue, reducing carbon emissions and mitigating climate change.
- **Need for Circular Bio-economy:** Transforming organic waste into compressed fuel and high-quality bio-manure (digestate) fosters a circular economy where waste becomes a resource.

Importance to the Country (National Level)

- **Energy Security:** CBG is a renewable gaseous fuel with properties similar to Compressed Natural Gas (CNG), making it a viable substitute for vehicular and

industrial applications. It helps achieve "Urja Atmanirbharta" (energy self-reliance).

- **Carbon Neutrality Goal:** By replacing fossil fuels, CBG reduces greenhouse gas emissions (methane capture) and supports India's climate commitments, such as achieving net-zero emissions.
- **Industrial Utility:** Purified CBG (over 95% methane) is suitable for direct injection into existing City Gas Distribution (CGD) networks, lowering capital investment requirements.
- **Strategic Investment:** The Reserve Bank of India (RBI) has included CBG projects under priority sector lending, encouraging investments of up to ₹50 crore for start-ups.

Importance to the Region (Regional & Rural Level)

- **Increased Farmer Income:** Farmers can earn additional income by selling cattle dung and agricultural residues to CBG plants.
- **Rural Employment:** These projects generate local employment in logistics, waste collection, plant operations, and maintenance.
- **Improved Agricultural Productivity:** The by-product, Fermented Organic Manure (FOM), is a rich source of nutrients that improves soil health, reduces reliance on chemical fertilizers, and supports organic farming.
- **Better Sanitation:** Proper handling of cow dung and urban waste reduces waste-related pollution, improving sanitation and hygiene in rural and semi-urban communities.

Key Government Initiatives Supporting CBG

- **SATAT Initiative:** Launched on 1 Oct 2018, aiming for 5,000 commercial plants to produce 15 MMT of CBG by 2025–26.
- **GOBARdhan Scheme:** Focused on managing rural waste to produce biogas and organic manure, with over ₹10,000 crore investment planned.

- **Bio-MANURE Integration:** The central government encourages mandatory offtake of bio-slurry (fermented organic manure) by fertilizer companies for sale to farmers.

Advantages of Bio- CNG/CBG

- Bio-CNG has a lower maintenance cost as compared to other Hydrocarbon fuel vehicles.
- Bio-CNG fuel systems are completely sealed, preventing any losses due to spills, leaks, or evaporation in the air.
- Less pollution and more efficiency.
- It is less likely to ignite on hot surfaces, and has an auto-ignition temperature of 540°C.
- Much safer than Petrol or diesel-powered vehicles.

4.0 Demand Supply Gap :

The demand-supply gap in the compressed biogas (CBG) sector in India is characterized by a massive untapped potential against slow implementation. While the country has an estimated CBG production potential of 40–60 million metric tonnes per annum (MMTPA), as of early 2025, only a fraction of this is utilized, with around 100-150 plants operational out of over 4,000+ planned projects under the SATAT scheme.

Key Aspects of the Demand-Supply Gap:

- **Massive Potential vs. Low Realization:** India generates over 730 million tonnes of agricultural residue and over 150 million cattle population, providing immense raw material for CBG. However, actual production is less than 1% of the potential.
- **High Demand Driver (CGD Integration):** Due to high import dependence (around 50% of natural gas requirement), there is a strong demand for clean energy alternatives. The government mandates a phased blending of CBG in City Gas Distribution (CGD) networks, starting with 1% in FY26 and increasing to 5% by FY29.
- **Operational Bottlenecks (Supply Side):** Many projects face issues with continuous feedstock supply, financial bottlenecks, and technological hurdles, leading to delays in commissioning projects.

- **Geographic Mismatch:** Demand is concentrated in urban areas (CNG for transport), while feedstock is in rural areas, leading to high transportation costs.

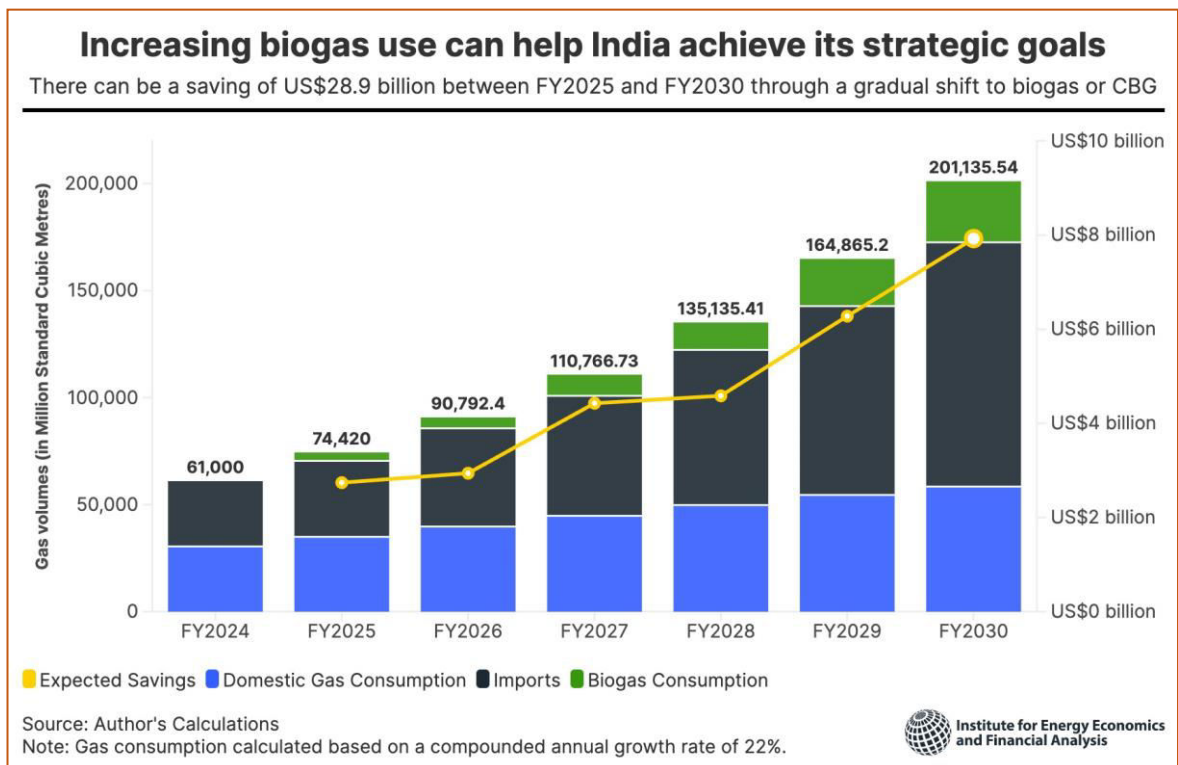
5.0 Imports vs. Indigenous Production:

India's overall natural gas supply is short by approximately 30,000 million standard cubic meters (MMSCM), which CBG is intended to plug through imports. The Sustainable Alternative Towards Affordable Transportation (SATAT) initiative promotes domestic production of CBG from agricultural residue, cattle dung, and municipal solid waste and industrial wastes.

The government is implementing a phased Compressed Biogas Blending Obligation (CBO) scheme, starting with 1% CBG for Compressed Natural Gas (CNG) and PNG by April 2025, scaling up to 5% by 2028-29.

Increased CBG use can save India approximately \$29 billion in import bills between FY2025 and FY2030.

While CBG production is being ramped up domestically, the policy focus remains on replacing imports rather than importing CBG itself.



6.0 **Export Possibility:**

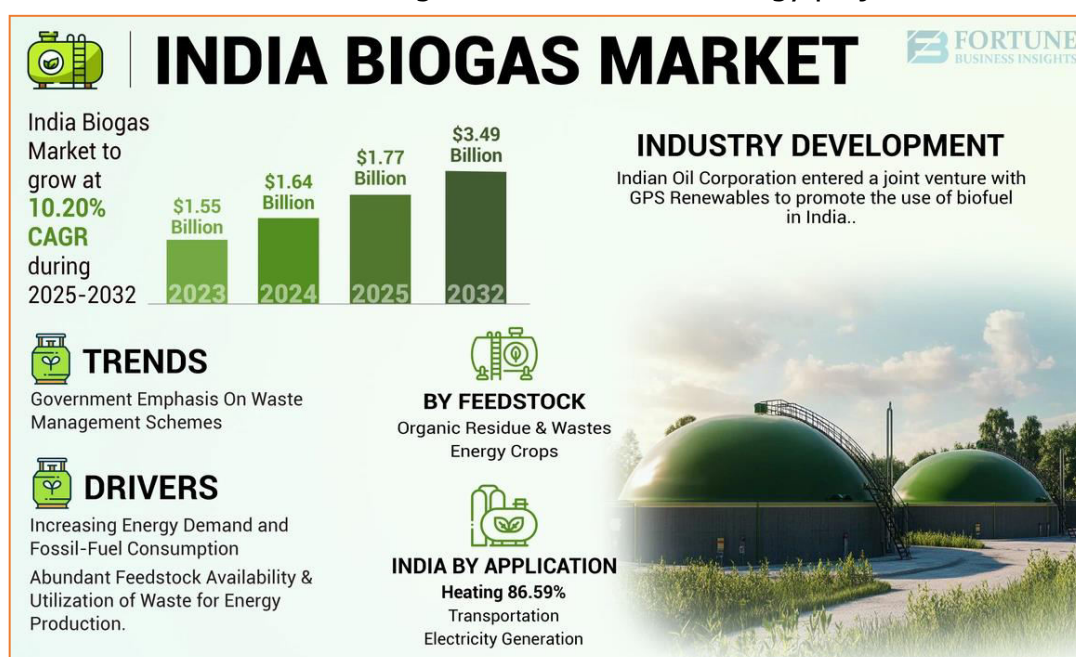
India has significant potential to become a global exporter of Compressed Biogas (CBG) technology, engineering services, and, in the long term, CBG itself, driven by a potential annual CBG production of 40-60 MMTPA from agricultural waste and biomass. While initial efforts focus on import substitution, the robust growth of the domestic biogas sector creates opportunities to export technology, know-how, and sustainable waste management solutions to other nations.

7.0 **Domestic/Export Market:**

India's compressed biogas (CBG) market is rapidly expanding, with a projected growth to USD 2.4–37.6 billion by 2032, driven by the SATAT scheme aimed at reducing reliance on imported natural gas. The market is primarily domestic, focusing on substituting CNG in transport and PNG for cooking, with massive potential (40-60 MMTPA) that is currently less than 1% utilized.

Currently, India's CBG focus is overwhelmingly domestic to meet its 2070 net-zero targets and reduce the ~\$29 billion in LNG import bills.

Potential export market: There is potential for long-term export of, or foreign direct investment (FDI) in, technology, technical expertise, and potentially certified carbon credits resulting from the waste-to-energy projects.



8.0 **Employment Generation (Direct & Indirect)**

The proposed CBG project will generate employment opportunities both in direct and indirect manner. In direct mode people will get jobs in proposed CBG project and as well as in indirect mode in various forms. CBG Project requires 30 nos. manpower including Plant Supervisor, Plant operator, Marketing officer, Procurement officer and Administrative Staff.

9.0 **Project Description:**

(i) **Type of project including interlinked and inter dependent project:**

At present EIBPL is operating 100 KLPD grain-based distillery (for production of Ethanol) with 2.5 MW Cogeneration power plant.

EIBPL intends to diversify its project for production of Compressed Bio Gas (CBG) by utilizing thin slop generated in its own distillery project as primary feed stock.

With stable ethanol operations and consistent effluent generation, the company now proposes to integrate a Compressed Bio-Gas (CBG) plant of 6 TPD capacity to monetize organic residues and improve environmental sustainability.

Currently, EIBPL processes broken rice (surplus FCI rice) and maize as the primary feedstock through a multi-stage process involving liquefaction, fermentation, distillation, and dehydration.

It is proposed that Thin slop, piped directly via a 450-metre stainless steel line, serves as the CBG's primary liquid feedstock, eliminating disposal challenges and achieving zero liquid discharge compliance under Central Pollution Control Board (CPCB) guidelines.

This integration minimizes transport costs, utilizes shared utilities - e.g., Water and Power. Company will also enter into Offtake arrangement through Tripartite Agreement (TPA) with GAIL and Indian Oil Corporation Limited (IOCL) ensuring revenue stability, while fertilizer by-products support local agriculture.

(ii) **Location:**

Village : Parora
Block : Krityanand Nagar
District : Purnia
State : Bihar

(iii) **Details of alternate sites Considered and the basis of selecting the proposed site, particularly the environment consideration gone into should be highlighted.**

No alternate sites have been considered for the proposed CBG project, as it is a diversification in existing distillery project for reproducibility from effluent generated in distillery project. Land is under possession of project proponent and availability of water, raw materials and transportation facilities are adequate at present site.

(iv) **Size or magnitude of operation:**

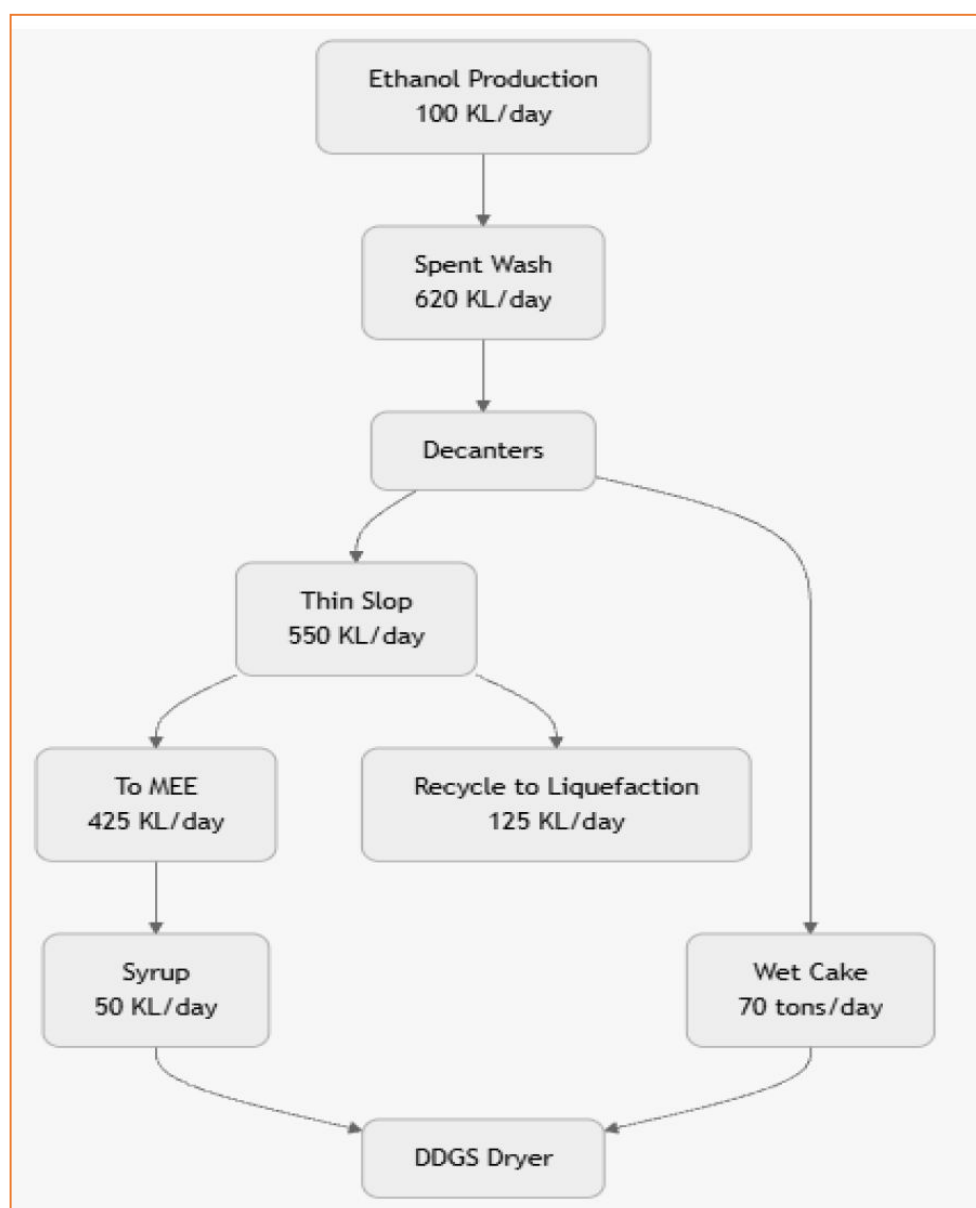
Project Description	Existing Scenario	Proposed Scenario	Final Production
Grain Based Distillery Unit and Cogeneration Power Plant	100 KLPD Grain-based Distillery (Ethanol) plant and 2.5 MW Captive Power Plant	NA	100 KLPD Ethanol and 2.5 MW Power Cogeneration
Compressed Biogas Plant	NA	6 TPD	6 TPD Compressed Biogas

(v) **Raw Material required along with estimated Quantity, likely source, marketing area of final products, mode of Transport of raw material & finished product.**

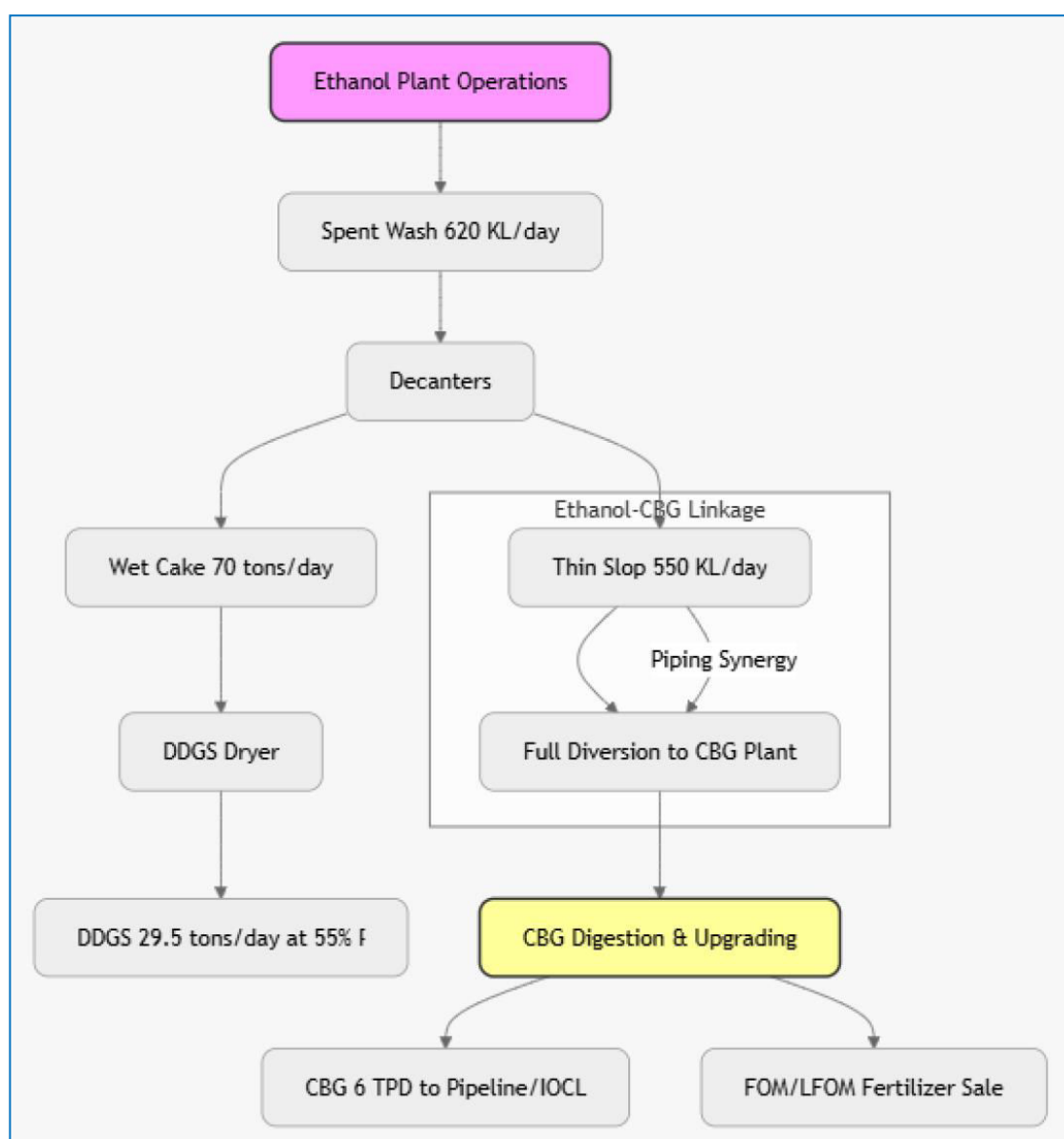
Item	Raw Material Requirement
Thin Slop (Primary raw material)	550 m ³ /day
Agricultural residues such as maize stalk, corn cob, paddy straw, and cow dung (Alternative raw material)	25 MT/Day

10.0 **Project description with process details: (a schematic diagram/flowchart layout, components of the project)**

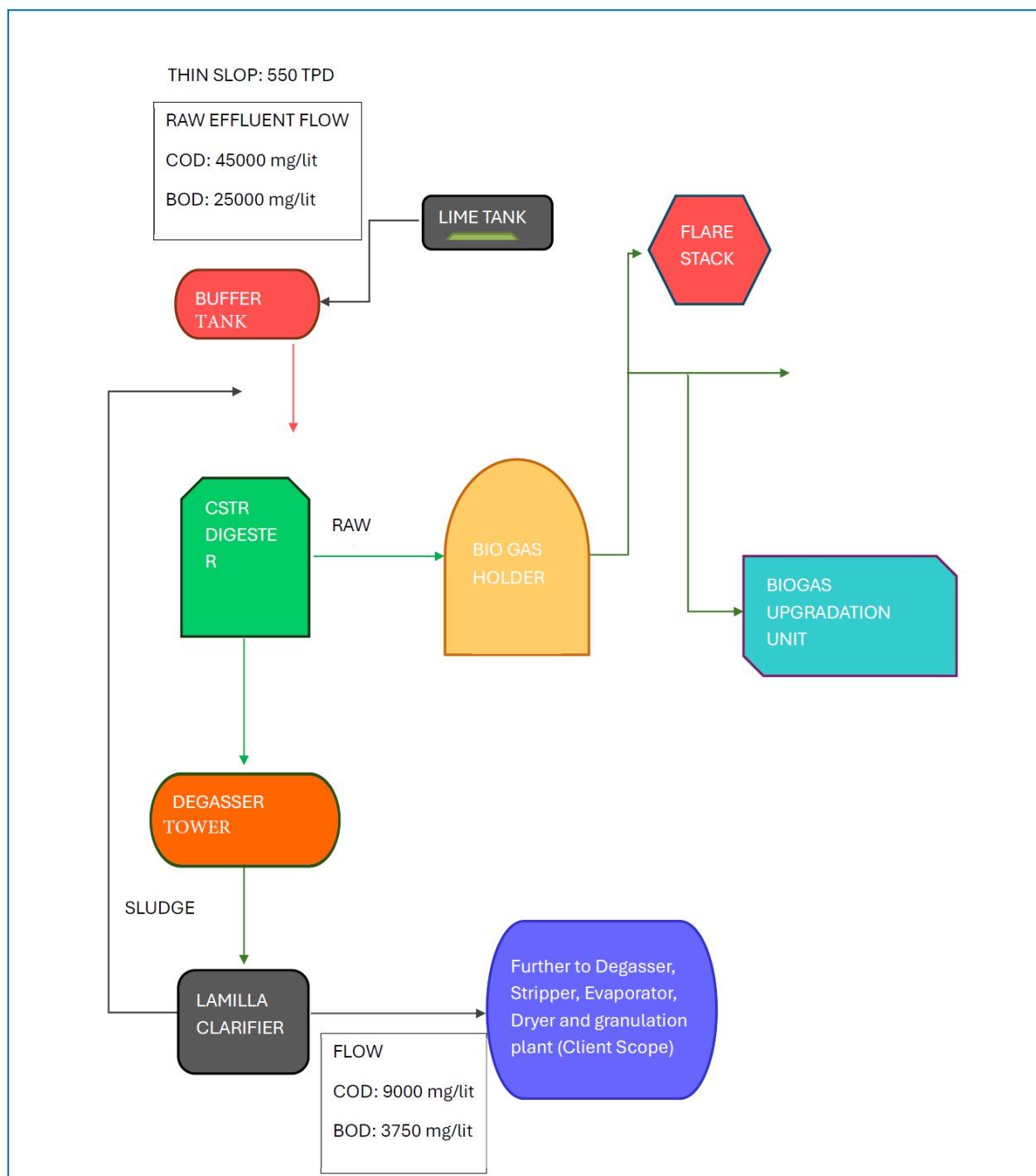
Existing Production Methodology ;



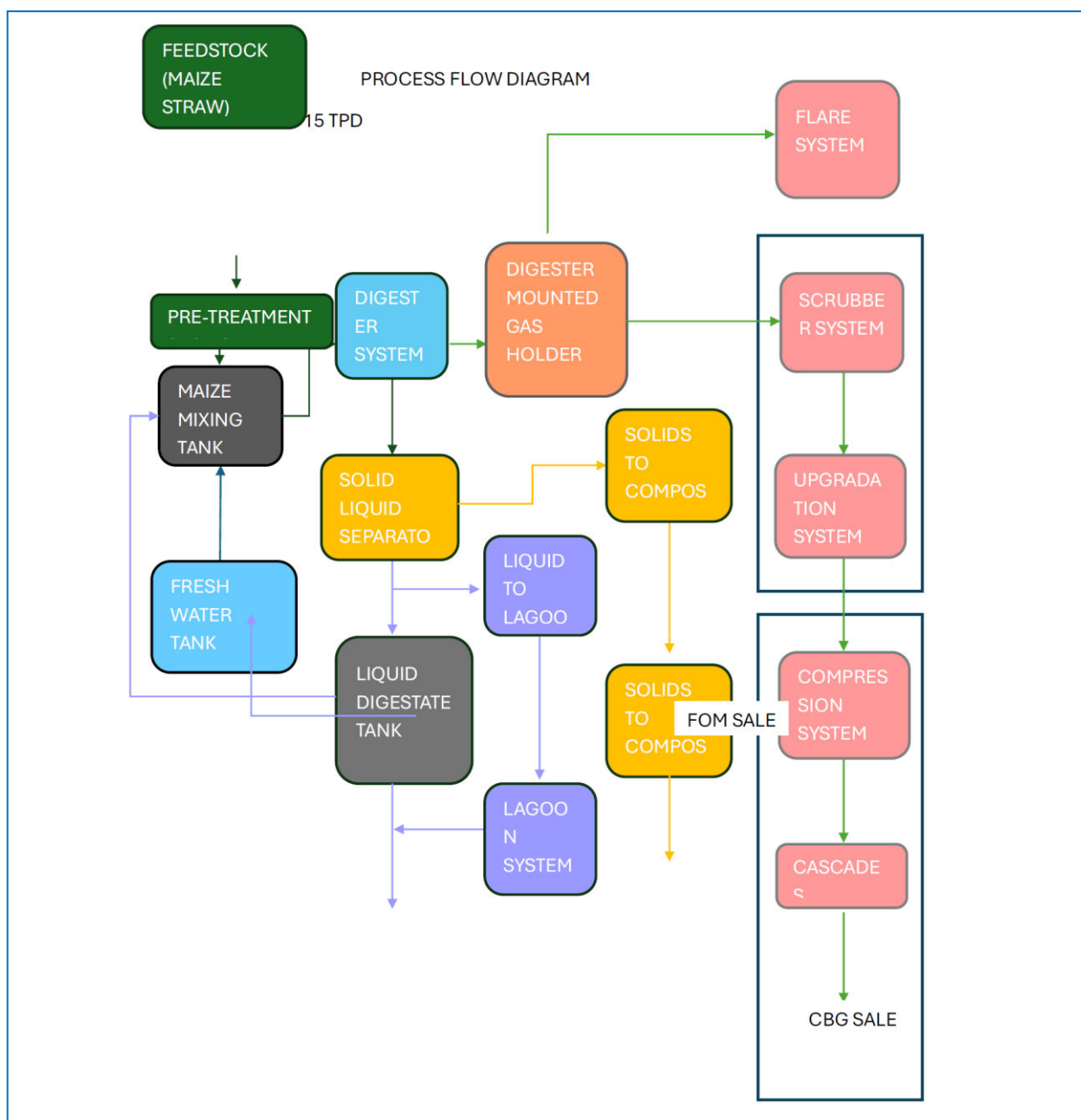
Proposed Integration with existing EIBPL Operations

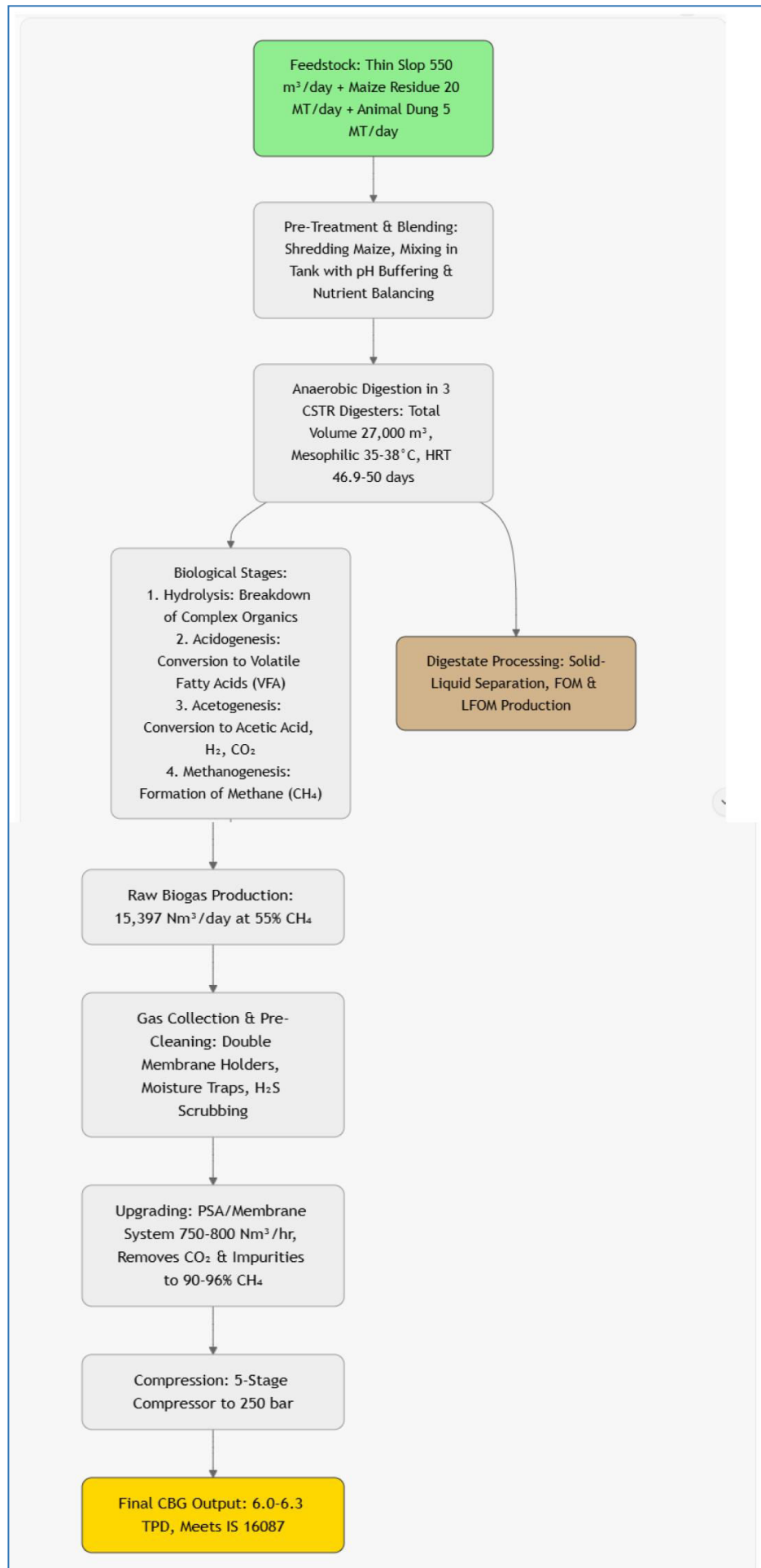


CBG PRODUCTION PROCESS ; FROM DISTILLERY WASTE



FROM AGRICULTURAL FEEDSTOCK





Compressed Bio-Gas (CBG) production is a sustainable process that transforms organic waste materials into a clean, renewable fuel source equivalent to Compressed Natural Gas (CNG). In the context of Eastern India Biofuels Private Limited's (EIBPL) proposed 6 Tonnes Per Day (TPD) CBG plant in Purnia, Bihar, the process is designed to utilize a multi-feedstock approach, primarily leveraging thin slop from the adjacent ethanol distillery, supplemented by maize residue and animal dung.

This aligns with the technical specifications outlined in the GWET Aqua Management Pvt. Ltd. technical note and the Tectiko Innovations & Equipment Pvt. Ltd. proposal, which emphasizes a Continuous Stirred Tank Reactor (CSTR)-based anaerobic digestion system for stable, high-efficiency biogas generation.

The overall process begins with feedstock preparation, proceeds through biological digestion, gas purification, and ends with compression and dispatch, ensuring compliance with IS 16087:2016 standards for vehicular fuel.

This method not only addresses waste management challenges but also produces valuable by-products like bio-fertilizer, contributing to a circular economy model. The plant's configuration, with three 9,000 m³ digesters (total 27,000 m³ working volume), is engineered for mesophilic operation at 35–38°C, optimizing microbial activity while maintaining process stability through feedstock blending, controlled loading rates, pH buffering, adequate alkalinity, and nutrient balancing.

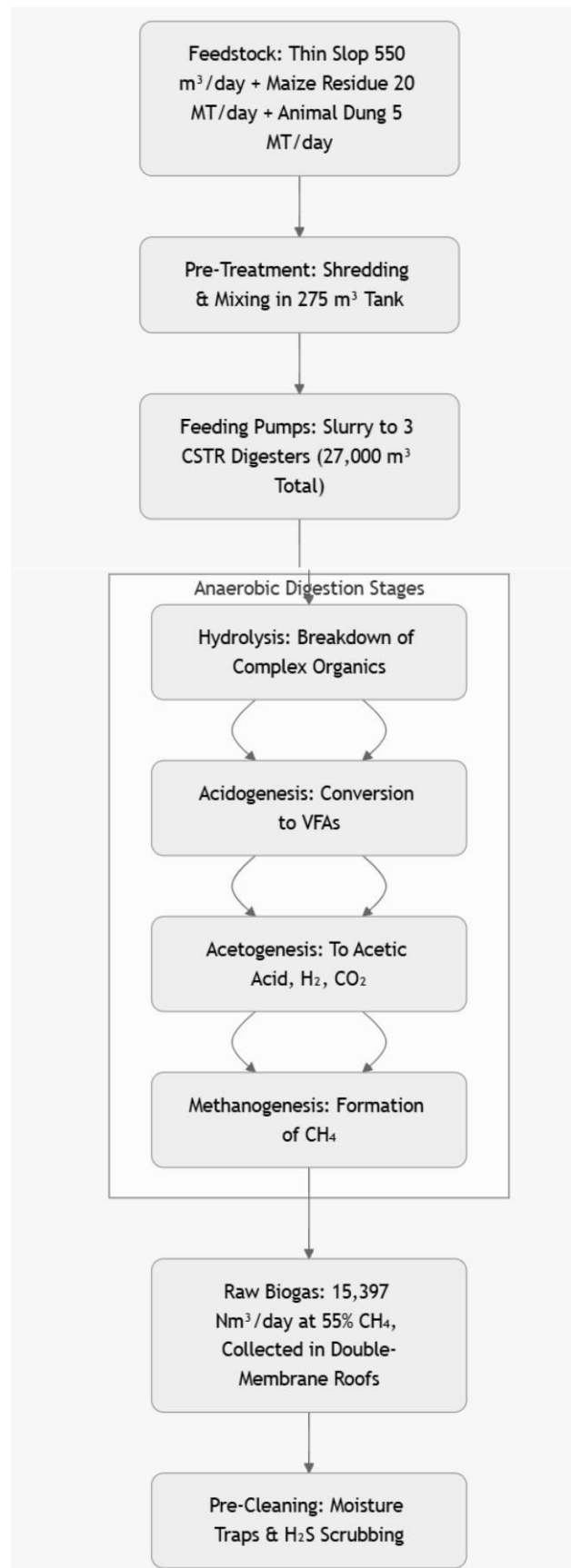
Feedstock Preparation

The production commences with feedstock receipt and pre-treatment, a critical step to ensure homogeneity and optimal digestibility. For EIBPL's plant, thin slop (550 m³/day, with Chemical Oxygen Demand (COD) of 46,000 parts per million (ppm), pH 4.41, and brownish-white opaque appearance) is piped directly from the ethanol plant's evaporator section via a 450-metre 3-inch stainless steel line, eliminating transportation costs and risks.

Maize residue (20 Metric Tonnes (MT)/day) and animal dung (5 MT/day) arrive by truck and are weighed before entering a 40 Tonnes Per Day (TPD) shredder, which reduces particle size to below 20 mm for enhanced surface area and faster hydrolysis. The Tectiko proposal underscores this phase with a screw feeder and mixing tank equipment, blending the shredded solids with thin slop and recycled digestate in a 275 m³ Reinforced Cement Concrete (RCC) mixing tank to achieve a balanced slurry with ideal carbon-to-nitrogen (C:N) ratio and pH 6.8–7.5.

This pre-treatment mitigates issues like acidification or nutrient imbalances, as noted in GWET's stability enhancement guidelines. Fresh water from a dedicated tank is added if

needed, ensuring the slurry's consistency for pumping into the digesters without clogging.



Anaerobic Digestion

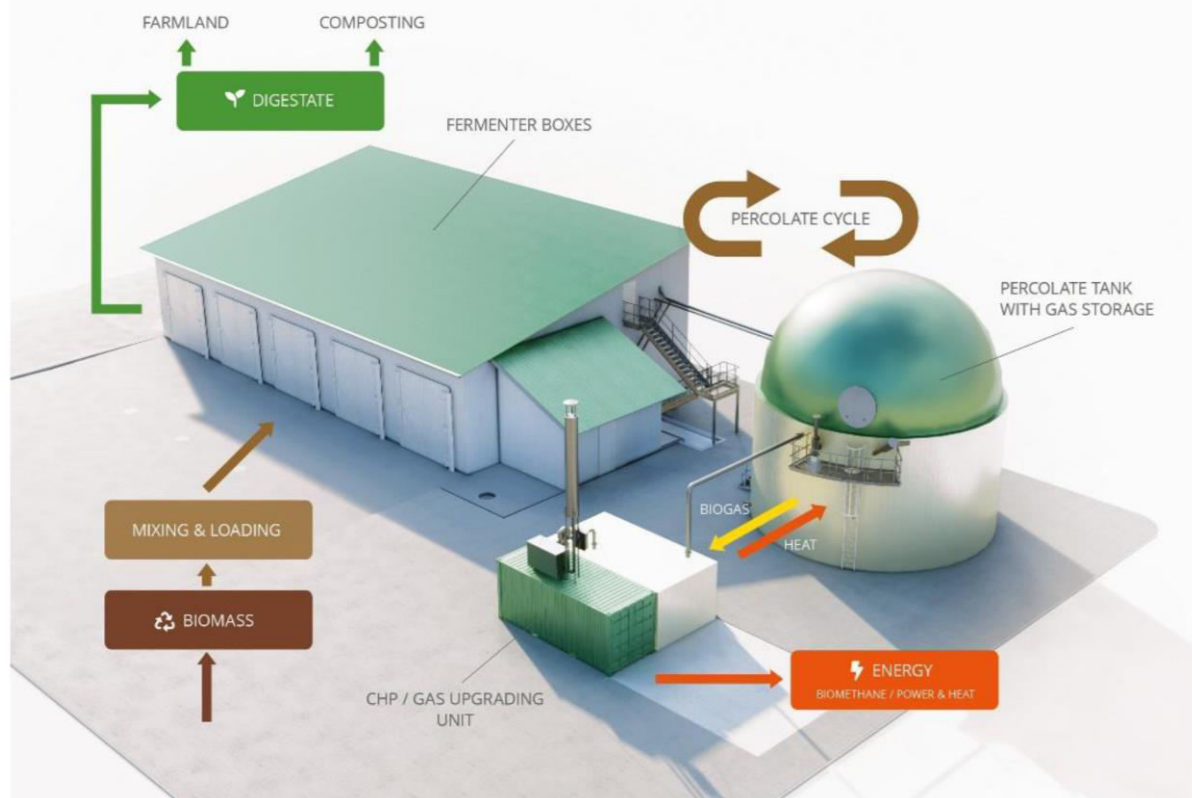
The core of CBG production lies in anaerobic digestion, where microorganisms convert organic matter into biogas under oxygen-free conditions.

In this plant, the prepared slurry is fed into three parallel CSTR digesters, each with 9,000 m³ capacity, operating continuously with mechanical and submersible agitators (15 kW each) to maintain uniformity and prevent sedimentation.

The process follows four sequential biological stages:

- **Hydrolysis**, breaking down complex organics like carbohydrates and proteins into soluble compounds;
- **Acidogenesis**, converting these into volatile fatty acids (VFA) and alcohols;
- **Acetogenesis**, further transforming VFAs into acetic acid, hydrogen (H₂), and carbon dioxide (CO₂); and
- **Methanogenesis**, where methanogenic bacteria produce methane (CH₄) as the primary energy component. GWET's note emphasizes mesophilic conditions for stability, with a total COD load of 24.75 tonnes/day converted at 83–85% efficiency, yielding 15,397 Nm³ of raw biogas daily (55% CH₄).

A **double-membrane roof on each digester (3,000 m³ storage)** collects the biogas at low pressure, with safety features like flare systems (600 m³/hr) to burn excess gas. The integrated heating system (stainless steel pipelines with electric water heaters) maintains optimal temperature, preventing process inhibition.



Upgradation and Purification

Following digestion, the raw biogas undergoes upgrading to remove impurities and increase methane purity, a step critical for meeting fuel-grade standards.

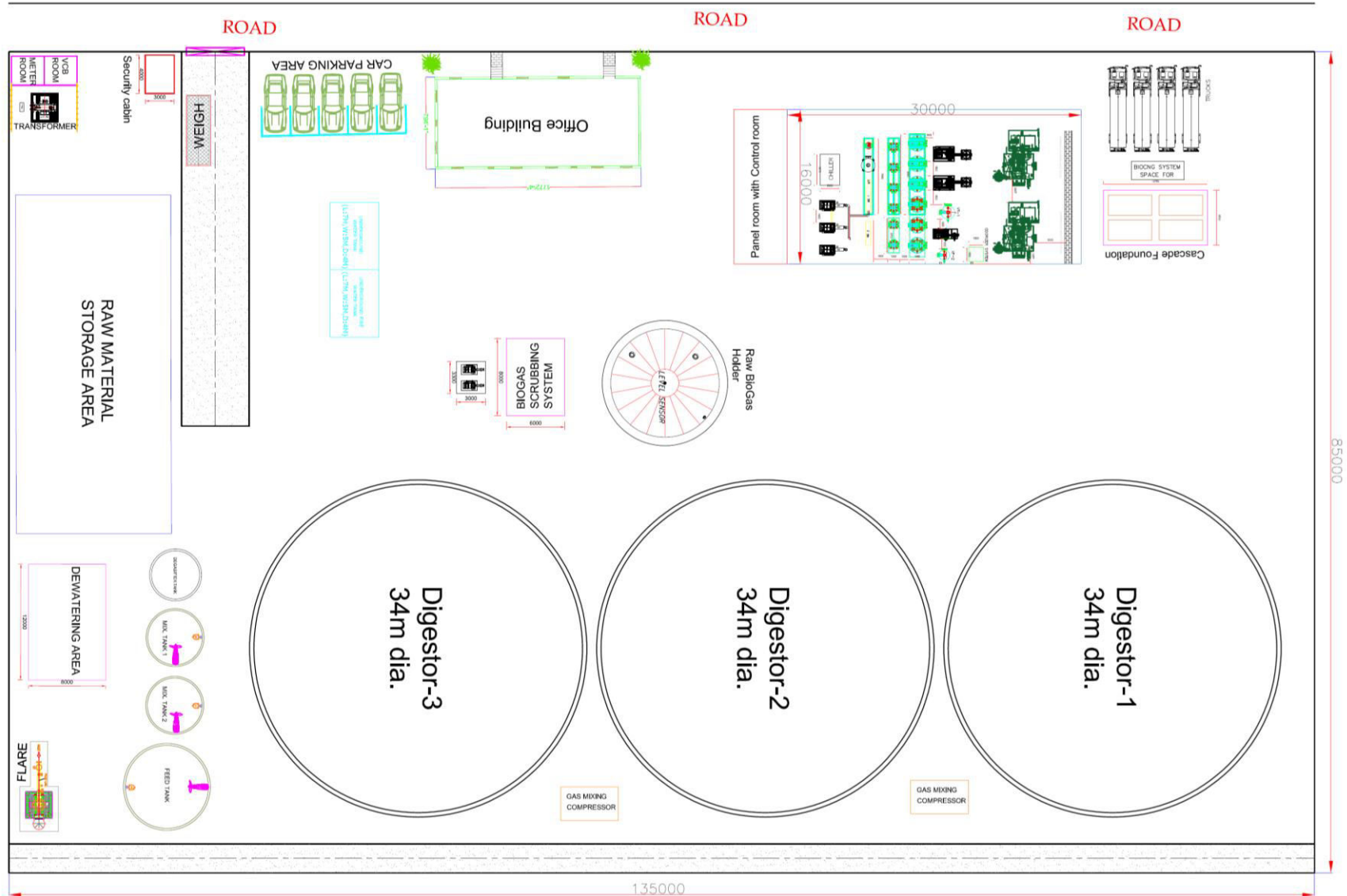
11.0 Plant and Machinery ;

S.N	Work and Machinery	Description	Capacity	Unit	Qty	
1	Raw Biogas Flow Meter	Thermal mass flow meter : thermal sensor consists of two sensing elements-a velocity sensors and a temperature sensors that automatically corrects the changes in the gas temperature. Flow rate : 318 to 8640 Nm ³ , power supply : 24VDC . Accuracy +/-1% , output :4-20mA	397	m ³ /hr	1	
2	Biogas Slurry Flow Meter	Electromagnetic Flow meter: flow rate : 32 to 320 m ³ /hr , power supply : 24 VDC. Accuracy : +/-1% output : 4-20mA	32-320	m ³ /hr	1	
3	Sensor	Pressure Level Transmitter	0 to 4	Mtr	2	
		Temperature transmitter	0 to 100	Deg C	2	
		PH Sensor	0 to 100	PH	2	

S.N	Work and Machinery	Description	Capacity	Unit	Qty	
1	Screw Feeder	operated through PLC for feeding raw material to mixing tank with auto mechanism	NA	NA	1	
2	Submersible Agitator	submersible Mixers 20 HP 3 Phase motor 415 v 50 Hz 1450 RPM Protection class IP68/ insulation class F=155 DC. Thermo control per phase as overheat protection, Cast iron /ss, propeller speed 300 rpm, with complete lifting arrangement.	15	Kwh	3	
3	Mechanical Agitators	Side Entry Mechanical Agitators, 20 HP , 3 Phase motor , 415 v 50 Hz 1450 RPM Protection class IP68/ insulation class F=155 DC. Thermo control per phase as overheat protection, Cast iron /ss, propeller speed 750 rpm with complete fitting arrangement pulley belt Driven	15	HP	'12	
4	Air Compressor	8 kg operating 2 stage air compressor with 200 litter storage capacity	6	HP	1	
5	Feeding Pump	feeding pump , 100 m3/hr capacity with suitable motor capacity	100	m3/hr	3	
6	Slurry pump	Horizontal shaft pump for solid transfer to solid liquid separator. 7.5 Hp, 3 Phase motor , 40 V , 50 Hz 1450 rpm	60	m3/hr	6	
7	Solid Liquid Separator	Digestate slurry separator with Complete System up to bag filling	10	Tone/hr	3	
8	Under pressure Tank	Pressure sensor with SS304 Water seal safety tank with level gauge	50	Ltr	3	
9	Over Pressure Tank	Pressure sensor with SS304 Water seal safety tank with level gauge	50	Ltr	3	
10	Heating System	SS304 1" Pipeline ,connected with SS304 , 4" manifold corrode resistance , with stand at every 2 meter ,ss rod grouted with chemical for stand support , leak proof and test at 10 bar , Gas Blower , Water Storage Tank , water pump , electric water heater.	16	Rounds	3	

11	double membrane Roof(top mounted)	European Standards	3000	m3	3
12	Moisture Trap	transparent tube with ss ball valve	NA	NA	5
13	Degasification Unit	1.5mm SS 304 Tank with water pump and related accessories	NA	NA	3
14	Inspection Window	250mm dia with wiper glass assembly	1	Pair	2
15	Sky Platform of Digester	7.5 m meter high ladder with sky platform of 1 meter width , surrounding digester platform with industrial anti corrosive paint	1 MTR WIDTH	Pair	3
16	Bar screen	unloading pit and mixing tank	(2mtr*3mtr) with 0.15 mm hole	Mtr	1
17	Bellow for feeding pump	for controlling the vibration of pump against pipeline	for controlling the vibration of pump against pipeline	8	Inch
19	flare system	for burning of unwanted raw biogas	for burning of unwanted raw biogas	600	m3/hr
20	others	nuts and Bolts , fischer chemical , welding rod and anchor fastener	nut & bolts , fischer chemical, welding rod and anchor fastener	N/A	N/A

CBG PROJECT LAYOUT PLAN



Resources optimization/recycling and reuse envisaged in the project, if any, should be briefly outlined.

Thin slop generated from existing grain based distillery project will be recycle and reuse as primary raw material in production of CBG.

From CBG plant primarily liquid digestate (liquid manure), along with smaller amounts of condensate will be generated, which will be subsequently reprocessed by drying in dryer to produce bio manure. These byproducts are generally rich in nutrients and are processed into organic bio-manure within project premises.

12.0 Availability of Water its source, Energy/Power requirement and source

a. Water Requirement for Proposed Distillery Project

The CBG process primarily requires water for feedstock dilution in the mixing tank (to achieve optimal slurry consistency), cooling in the biogas upgradation and compression systems, and minor cleaning operations, totalling approximately 30 KLD, which is well within the ethanol plant's sanctioned limit of 560 KLD from the Central Ground Water Authority (CGWA), where current consumption stands at 500 KLD, leaving a surplus of 60 KLD. The adjacency of the plants enables shared water pipelines (500 metres, 3-inch size), minimizing costs and ensuring efficient transfer.

b) Power Requirement and Source :

The CBG facility has a total connected load of 498.5 kW, with an average running load (at 75% diversity factor) of 373.875 kW.

(c) Boiler & Steam Requirement :

The proposed 6 TPD CBG plant requires approximately 1 TPH steam, primarily during winter months for maintaining the digester temperature at 36°C. Given that the existing 25 TPH boiler has an available spare capacity of approximately 3.3 TPH, the incremental requirement can be comfortably met without any additional boiler installation.

13.0 Environmental Management Plan ;

Waste Water Generation & Treatment :

From CBG plant primarily liquid digestate (liquid manure), along with smaller amounts of condensate will be generated, which will be subsequently dried in dryer to produce bio manure. These byproducts are generally rich in nutrients and are processed into organic bio-manure within project premises.

Air Pollution :

For proposed change in product mix due to new CBG plant of 6 TPD capacity, no addition or alteration is required in Boiler, Turbine Generator or other utilities like water, DM water and Ethanol/ Spirit and Raw material storage. Existing, AFBC boiler of 25 TPH capacity based on Rice Husk / Coal as fuel will meet the steam requirement of new CBG plant. Steam requirement of Ethanol Plant is 21 TPH and for proposed CBG plant steam requirement will be 2 TPH. In total 23 TPH steam is required for overall EIBPL project which will be met through existing 25 TPH boiler.

To prevent & control of emission from proposed CBG plant Membrane type CO₂ Scrubber, H₂S scrubber will be installed.

Solid Waste Management:

Solid waste	Quantity	Disposal
Fermented Organic residue	0.9 TPD	Bio Fertilizer

14.0 Estimated Project cost along with analysis in terms of economic validity

Particulars	Estimated Cost (in Crore Rs.)
Land (Contiguous Area)	3.18
Building & Civil Cost	3.23
Plant & Machinery	47.53
Misc. Fixed Assets	0.64
Interest and contingencies	4.41
TOTAL	58.99

The economic validity of a Compressed Biogas (CBG) project is generally strong from a long-term perspective, particularly when supported by government incentives, high-quality feedstock, and the sale of by-products like bio-fertilizer. However, projects often face high initial capital expenditures (CAPEX), which can make them sensitive to operational bottlenecks and supply chain risks. The

profitability of CBG projects is generally good, with a profit ratio often around 20% with proper management.

15.0 **Analysis of Proposal (Final Recommendation):**

(Financial & Social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.)

Compressed Biogas (CBG) projects offer significant financial benefits through government subsidies, revenue from multi-product sales, and operational cost savings. Developers can access Central Financial Assistance (CFA) of ₹4 crore per 4,800 kg/day capacity, capped at ₹10 crore per project. Additional income streams include selling fermented organic manure (FOM) supported by a Market Development Assistance (MDA) of ₹1,500 per metric tonne, alongside guaranteed fuel offtake agreements with Oil Marketing Companies.

Compressed Biogas (CBG) projects generate significant social value by improving public health, creating local employment, and fostering rural development. By converting organic waste into clean energy and bio-manure, these projects reduce indoor air pollution, mitigate disease spread from unmanaged waste, and empower communities through decentralized energy ownership. Furthermore, they promote sustainable agricultural practices, helping farmers transition to affordable organic fertilizers while building green skills among the workforce.

Compressed Biogas (CBG) projects provide critical environmental benefits by converting organic waste—such as agricultural residues, food waste, and manure—into clean energy, which diverts waste from landfills and prevents harmful methane emissions. This process mitigates climate change by replacing fossil fuels, reducing greenhouse gas emissions, and improving local air quality. Additionally, it promotes a circular economy by turning waste into energy and high-quality organic fertilizer (digestate)

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