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Dated: 24.02.2025

TECHNO-ECONOMIC VIABILITY STUDY REPORT

OF

**12,000 M3/DAY BIO GAS PRODUCING PLANT 5,000 KG
PER DAY BIO CBG CAPACITY**

SETUP BY

M/S W2JWALA BIOENERGY PVT LTD

REPORT PREPARED FOR

**M/S W2JWALA BIOENERGY PVT LTD, THE SUMMIT, SCO NO. 205, SECOND
FLOOR, VILL. SIGH PURA, CHANDIGARH AMBALA HIGHWAY, ZIRAKPUR,
DHARAMGARH, RUPNAGAR, S.A.S. NAGAR (MOHALI), PUNJAB-140306.**

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations
- Lender's Independent Engineers (LIE)

REPORT SUBMITTED TO

- Techno Economic Viability Consultants (TEV)
 - Agency for Specialized Account Monitoring (ASM)
- STATE BANK OF INDIA, SME BRANCH, VATIKA FIRST INDIA PLACE, MEHRAULI-GURGAON
ROAD, SECTOR-28, GURUGRAM, HARYANA-122002**

- Project Techno-Financial Advisors
 - Chartered Engineers
- Important - In case of any query/ issue or escalation you may please contact Incident Manager
Valuers@rkassociates.org. We will appreciate your feedback in order to improve our services.*

- Industry/ Trade Rehabilitation Consultants

**NOTE: As per IBA Guidelines please provide your feedback on the report within 15 days of its submission after
which report will be considered to be correct.**

- NPA Management
- Panel Valuer & Techno Economic Consultants for PSU
Banks

CORPORATE OFFICE:

D-39, 2nd floor, Sector 2, Noida-201301

Ph - +91-0120-4110117, 4324647, +91 - 9958632707

E-mail - valuers@rkassociates.org | Website: www.rkassociates.org


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TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

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TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

PART A	REPORT SUMMARY
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S. No.	PARTICULAR	DESCRIPTION
1.	Name of the Company:	M/s W2Jwala Bioenergy Private Limited
2.	Registered Address:	The Summit, SCO No. 205, Second Floor, Vill. Sighpura, Chandigarh Ambala Highway, Zirakpur, Dharamgarh, Rupnagar, S.A.S. Nagar (Mohali), Punjab, India-140306.
3.	Project Name	5,000 Kg per day Bio CNG generating plant.
4.	Project Location:	Khasra no. 200/349 to 350, Village Jaula Kalan (Hadbast No. 180), Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501.
5.	Project Type:	Bio CNG generating plant along with Fermented Organic Manure (FOM).
6.	Project Industry:	Renewable Energy
7.	Product Type / Deliverables:	Bio CNG, FOM and Carbon Credits
8.	Report Prepared for Organization:	M/s W2Jwala Bioenergy Private Limited
9.	Report Submitted to:	State Bank of India, SME Branch, Vatika First India Place, Mehrauli-Gurgaon Road, Sector-28, Gurugram, Haryana-122002
10.	TEV Consultant Firm:	M/s. R.K Associates Valuers & Techno Engineering Consultants (P) Ltd.
11.	Report type:	Techno-Economic Viability Report
12.	Purpose of the Report:	To assess Technical & Economic Viability for the purpose of seeking external financial assistance to start a green field Project.

13.	Scope of the Report:	To assess, evaluate & comment on Technical, Economical & Commercial Viability of the Project as per data information provided by the client, independent Industry research and data/ information available on public domain.														
14.	Date of Report:	24 th February, 2025														
15.	Documents referred for the Project:	<p>A. PROJECT INITIATION DOCUMENTS:</p> <ul style="list-style-type: none">1. Project Report2. Financial Projections of the Project3. Project Proposed Schedule4. Statutory Approval Details5. Layout and Master Plan <p>B. PROCUREMENT DOCUMENTS:</p> <ul style="list-style-type: none">1. List of Plant & Machinery along with acquisition costs for the same2. Process Flow Chart3. Sanction/proposed map of the sites4. Lease/Sale deeds of the Land5. GAS Purchase Agreement with GAIL <p>C. STATUTORY APPROVALS, LICENCES & NOCs</p> <ul style="list-style-type: none">a. MSME UDYAM Registration Certificateb. Commercial Agreement with GAILc. CTE from PPCBd. Gobardhan Certificatee. GST Certificate														
16.	Means of Finance:	Equity & Debt (D/E Ratio 1.00 TPC)														
17.	Key Financial Indicators:	<table><tr><th>Key Indicators</th><th>Value</th></tr><tr><td>Average DSCR</td><td>1.75</td></tr><tr><td>Average EBITDA Margin</td><td>57.70%</td></tr><tr><td>Avg. PAT Margin</td><td>32.19%</td></tr><tr><td>NPV & IRR</td><td>INR 56.38 Cr. & 20.39%</td></tr><tr><td>Payback Period</td><td>7.86 years</td></tr></table>			Key Indicators	Value	Average DSCR	1.75	Average EBITDA Margin	57.70%	Avg. PAT Margin	32.19%	NPV & IRR	INR 56.38 Cr. & 20.39%	Payback Period	7.86 years
Key Indicators	Value															
Average DSCR	1.75															
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Avg. PAT Margin	32.19%															
NPV & IRR	INR 56.38 Cr. & 20.39%															
Payback Period	7.86 years															

Note: Above financial indicators are based on the financial projections of the proposed project provided by the firm and assessment and analysis of the same done by us.

PART B

INTRODUCTION

1. ABOUT THE REPORT:

This is a Techno-Economic Viability Study Report of the proposed compressed biogas plant (Bio-CNG, 5,000 kg/day) at Khasra no. 200/349 to 350, Village Jaula Kalan (Hadbast No. 180), Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501, setup by M/s W2Jwala Bioenergy Private Limited.

2. EXECUTIVE SUMMARY:

M/s Jwala Bioenergy ApS intends to set up a 12,000 m³ /day (raw biogas), 6800 Nm³ /day (upgraded) biomethane (CBG) plant. They have conceived this Project to reap out the growing demand of Bio-CNG in the transport sector due to the phased mandatory blending of compressed biogas (CBG) in compressed natural gas (CNG) which has been announced by the Government of India in the recent Interim budget of FY 2024-25. The subject project is part of the Govt. initiative "Swachh Bharat Abhiyan" and for providing green energy.

The plant will be based on a multi-feedstock mix of paddy straw, cow dung, and chicken litter. The plant is located at Jaula Kalaan Village, Dera Bassi Tehsil, SAS Nagar District, Punjab. Jwala Bioenergy is developing this project through its SPV project company, M/s W2Jwala Bioenergy Private Limited. The 50% of the volume of the CBG produced is committed on a Take-Or-Pay basis as per the information shared with us and rest of the volume on Reasonable Endeavour Basis (RE Basis) at the designated delivery point, which will be supplied to CNG (Transport) and PNG (Domestic) segments in Chandigarh Geographical Area (GA) (GA-2.01) of Indian Oil-Adani Gas Private Limited (CGD Entity).

The project is backed by a robust assurance framework with multiple guarantees designed to protect both the developer and the lender. These include:

1. A **Take-Or-Pay Guarantee** covering 50% of the committed volumes, ensuring revenue stability.
2. A **raw biogas production volume guarantee** provided by the technology supplier, Sauter Biogas, mitigating production risks.
3. An **uptime guarantee of 96%**, ensuring fault-free operation for at least 96% of the hours in a 12-month period, as guaranteed by the EPC contractor, ISGEC.

W2Jwala Bioenergy Pvt Ltd, the SPV project company formed by the parent, Jwala Bioenergy ApS in May 2023. Jwala Bioenergy was allocated Dera Bassi tehsil on 4th Sep

2023. Jwala Bioenergy's project report was reviewed by the empowered committee of PEDA and accorded approval on 16th April 2024.

Ministry of Petroleum & Natural Gas, Government of India (MoP&NG), in furtherance of guidelines dated 03.02.2014 and 20.08.2014 (as amended), has vide letters No. L-16022/05/2020-GP-I (E-35118) dated 09.04.2021, 26.10.2021 and 26.10.2023 issued policy guidelines for synchronisation of CBG produced by plants under SATAT scheme in the CGD network wherein GAIL has been mandated to operationalise the CBG-CGD Synchronisation Scheme and supply Biogas/CBG co-mingled with domestic gas at Uniform Base Price (UBP) to CGD entities for use in CNG (T) & PNG (D) segments of CGD network. Moreover, the government has set a target of 5% FY28-29, following a carrot-and-stick approach to incentivize CGD Company to offtake biogas.

On 18th February 2025, the company has signed a Purchase/LOI/Tripartite Agreement (W2Jwala Bioenergy Private Limited, Indian Oil-Adani Gas Private Limited (IOAGPL) and GAIL) for Purchase and Sale of Biogas/CBG under CBG-CGD Synchronisation Scheme under SATAT initiative to promote Compressed Bio-Gas as an alternative, green transport fuel, with the contract set to run until 2034. **(Ref No.: WBPL-IOAGPL (GA-2.01)-GAIL dated 18.02.2025)**

Under this agreement, GAIL will purchase the CBG from W2Jwala (Seller/Producer) and onward sale of Biogas/CBG by GAIL to the CGD Entity after pooling with APM/NAPM domestic gas, meeting the required specifications, for use in Geographical Area of Chandigarh [GA-2.01] in the State of Chandigarh, Haryana, Punjab & Himachal Pradesh.

As per the data/information shared by the client, W2Jwala will lay a tie-in pipeline from CBG/Biogas plant upto a distance of 10 KMs for connecting with CGD (IOAGPL) Entity's pipeline network and shall do necessary compression arrangement to inject/deliver Biogas to CGD entity through pipeline.

The plant will process 38,000 tons of agro and animal waste annually, including up to 14,000 tons of paddy straw, addressing stubble burning and reducing India's reliance on energy imports. This initiative will generate wealth for the local community, directly benefiting around 2,500 households and increasing household incomes by 10-20% for approximately 12,500 individuals. Additionally, the project will create indirect employment for 100 local workers, including agricultural laborers and logistics personnel, and directly employ 9 technical and non-technical staff at the facility. The project will also contribute to reducing greenhouse gas emissions by replacing fossil-based energy sources.

As per the lease deed shared by the client/company, the promoters have leased 11.73 Kille (~39351.23 sq. meter.) of land at Khasra no. 200/349 to 350, Village Jaula Kalan (Hadbast No. 180), Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501. This land has been leased out in the name of the company for 16 years with an option of with an option of renewal of 10 years at the end of lease as per the shared lease deed executed on 27th September 2024, for setting up the proposed Bio-CNG plant.

Once completed, the plant will be able to produce up to 2.4 million Sm³, and will generate other revenue streams through its by-products, such as Fermented Organic Manure (FOM) and carbon credits. The project is consented, holding the allocation of tehsil, with the project's Detailed Project Report receiving approval from the empowered committee for renewable projects in Punjab state, and has a signed offtake agreement with GAIL (India) Limited.

Proposed Biogas Plant Capacity			
Sr. No.	Particular	Capacity	Unit
1	Raw Biogas Plant Generation	12,000	M3/Day
2	Compressed Biogas Generation	6,800	M3/Day
3	Bio-CNG Plant Capacity	5,000	kg/Day
4	Fermented Organic Manure (FOM)	107	Ton/Day

Source: DPR/data/information provided by the company

As per the data shared with us, the project will utilize a design provided by PlanEnergi and a biogas solution from the German firm Sauter, known for handling straw and solid feedstocks effectively, making it ideal for a feedstock mix heavy in paddy straw. Sauter's technology has been successfully implemented in multiple plants in Germany and Denmark, including the largest plant in Northern Jutland, which processes significant amounts of straw and produces 30 tonnes of methane daily.

The biogas upgrading process uses a membrane system, a preferred solution in Europe since 2017, due to its high reliability, performance, and low energy consumption. The project is positioned to benefit from India's new Compressed Biogas Blending Obligation (CBO), which mandates that 5% of compressed natural gas (CNG) in City Gas Distribution (CGD) networks be blended with Compressed Biogas (CBG). The government is also aiming to increase the quantity of natural gas in its energy mix up to 15% by 2030, and the natural gas price is regulated by a gap and collar, with CBG sold at a premium above the natural gas price.

W2Jwala has provisionally approved placing a turnkey order for the design, engineering, manufacturing, procurement, transport, erection, and commissioning of machinery.

equipment, and civil structures for a 5 TPD CBG plant in Dera Bassi with ISGEC (Ref: DERABASSI/19/05/LOI/ISGEC dated 17th February 2025). As per the information provided by the company, the contract proposal being negotiated with ISGEC (EPC) has an uptime guarantee of 96% hours of fault-free operation for equipment supplied and installed by the EPC.

The EPC scope will cover engineering, procurement, installation, and commissioning, excluding the Process-Provider (Sauter Biogas) equipment, which will be directly procured by the Developer. The Developer holds primary responsibility for securing permits, though they may request assistance from the EPC or delegate certain responsibilities.

ISGEC will follow a plug-and-play approach with Sauter, with all core process equipment would be packed by Sauter into a containerized solution. Integration with the rest of the plant will be supervised by Sauter's German engineers on-site. The plant will inject CBG into the City Gas Distribution (CGD) grid, managed by Indian Oil-Adani Gas Private Limited under the CBG-CDG Synchronization scheme. The layout plan, prepared by ISGEC, is pending approval from the relevant authorities.

At Financial Close, the project company will sign a comprehensive O&M contract with an experienced local operator, such as Veolia's local subsidiary, Ecofinity Solutions, or ISGEC's O&M division. They will be able to evidence of an average target availability of 96% (under negotiation) on their current operation of similar plants. It will cover full-service O&M, including scheduled and unscheduled maintenance, feedstock services, daily plant operation (including labor), and provision of a technical team and site manager (a qualified marine engineer). The contract will also include capital replacement.

The Jwala plant has been welcomed in the local community and Jwala have built on this goodwill and intensively cultivated close co-operation with local farmers through close contact and forming a relationship with the NGO, Reviving Green Revolution Cell (RGR). One of the goals of the engagement with RGR Cell is to mobilize community organizes such as cooperatives to prevent stubble burning and collect the straws. Jwala aims to make these organisations co-owners in the plant for long-term bundling of community interest.

As per the details shared by the company, the cost of the proposed project from scratch to trial run is being estimated as INR 59.84 crores, which is proposed to be funded through promoter's margin of INR 29.92 crores and bank loan of INR 29.92 crores. Project cost breakup is shown in later section of the report.

As per data/information provided to us, all permissions would be applied through a Single-Window online portal called 'Invest Punjab Business First'. The company has obtained NOC

for Consent to Establish from Punjab Pollution Control Board. The company is yet to apply for the rest of the NOCs required such as PESO, Sanctioned Map approval, Fire NOC etc. from the respective authorities (*Refer the section Statutory Approval in the later part of the report*).

During the site visit, we found that the proposed land is a vacant land which is not demarcated and work on the Project has not been started yet. As per informed by client, land development work will start soon. (*Kindly refer the site pictures captured during the survey attached in the later section of the report*).

As per the data/information provided by the client, the plant will consume about 5048 kWh of power per day and ~20 KL/ day of water to meet process energy requirement. Currently, the company is in the process to apply for power load connection and ground water extraction approval. Company has planned to achieve the C.O.D by 1st May 2026.

At present, the company is in discussion with multiple financial institutions to fund the project through a term loan of INR 29.92 crores. In this regard M/s W2Jwala Bioenergy Private Limited has appointed R.K. associates to assess the Techno-Economic Viability of the proposed Bio-CNG production plant at Village Jaulan Kalan, Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501.

As requested by the company, the TEV report of the project is submitted to State Bank of India, SME Branch, Vatika First India Place, Mehrauli-Gurgaon Road, Sector 28, Gurugram Haryana-122002. The company plans to achieve loan approval by March 2025 and the financial closure by April, 2025 (expected).

3. PURPOSE OF THE REPORT:

To assess Project's Technical and Financial Feasibility for lender's requirement.

4. SCOPE OF THE REPORT:

To only assess, evaluate & comment on Technical & Financial Feasibility of the proposed Bio-CNG generating plant being set up by M/s W2Jwala Bioenergy Private Limited as per the information provided by the company.

NOTES:

- Project status is taken as per the Site inspection carried out by our survey team.
- Scrutiny about the company, background check, and credibility, credit worthiness of the company or its promoters is out-of-scope of this report.

- Any verification of the documents/ information from originals/ source is out-of-scope of this report.
- This report is only an opinion in respect to Technical and Financial Feasibility of the project as per the future Projections provided by the firm and independent analysis done by us and doesn't contains any recommendations including taking decision on the loan or any other financial exposure.
- This is not an audit activity of any kind. We have relied upon the data/ information shared by the company in good faith.
- Detailed cost estimation or detailed cost vetting is out of scope of the project.
- This is not a Detailed Project Report or a detailed design or architecture document. Land and property details mentioned in the report is only for illustration purpose as per the information provided to us by the client. The same doesn't tantamount for taking any responsibility regarding its legality, ownership and conforming to statutory norms.
- Any review of the existing business of the promoters is out of scope of this report.

5. METHODOLOGY/ MODEL ADOPTED:

- Data/ Information collection.
- Review of Data/ Information collected related to TEV study.
- Independent review & assessment of technology used and financial projections provided by the company.
- Projections of Revenue, P&L, Balance Sheet, Working Capital Schedule, Depreciation Schedule, Loan Schedule as per the inputs given by the company and assessed by us
- Calculation of key financial indicators and ratio analysis including DSCR, NPV & IRR and payback period of the project.
- Report compilation and Final conclusion.

6. DATA/ INFORMATION RECEIVED FROM:

All the data/Information has been received from Mr. Bikramjeet Singh Guram and the required details about him shown in the below table:

Particulars	Details
Designation	Managing Partner
Company	Saba Capital
Email Address	bikramjeet.guram@sabacapitalindia.com
Contact No.	+91-9871119734

7. DOCUMENTS / DATA REFERRED:

- a. Detailed Project Report and Promoters Profile.
- b. Financial Projections of the proposed Bio CNG generating project.
- c. Production flow chart.
- d. Product profile along with Pricing Strategy etc.
- e. List of expected Raw Material Suppliers.
- f. Selling, Marketing & Distribution Plan, Commercial Agreement with GAIL.
- g. Approved Site/Layout Plan.
- h. Sale/Lease deed of the land.
- i. Technical Offer Bid from EPC contractor (ISPEC) along with details of Plant & Machinery and Civil Works.
- j. Technical Offer Bid from Technology consultant (Sauter Biogas GmbH) along with details of Plant & Machinery.
- k. Survey Report conducted at the site.





PART C

COMPANY PROFILE

1. COMPANY OVERVIEW:

As per certificate of incorporation shared by the client/company, M/s W2Jwala Bioenergy Private Limited was incorporated on May 19, 2023 as per the Companies Act, 2013 as an unlisted company limited by shares. As per information shared by the client, the company is incorporated with the objective to carry on the business to produce, market, sell, supply, distribute and dealing in all kinds of bio-gas, Bio-CNG likes or containing a mixture of H₂S, CH₄, hydrocarbon, and CO₂ from agricultural residue, and cattle & chicken manure as well as dealing its by-products like organic fertilizers. Below table shows the incorporation details of the company:

Incorporation Details of the Company	
Particular	Description
Company Name	M/s W2Jwala Bioenergy Ltd
Date of Incorporation	19 th May 2023
CIN	U35103PB2023FTC058577
Company Category	Unlisted Company limited by Shares
Company Subcategory	Subsidiary of company incorporated outside India
ROC	Chandigarh
Registered Address	The Summit, SCO No 205, Second Floor, Vill. Sighpura, Chandigarh Ambala Highway, Zirakpur, Dharamgarh, Rupnagar, S.A.S. Nagar (Mohali), Punjab, India-140306
Authorized Capital	INR 5,00,00,000/-
Paid up Capital	INR 90,00,000/-

Source: As per the data shared by the client and available on the MCA website

The company is categorised as micro enterprise with Udyam Registration Number UDYAM-PB-20-0074502. In this company, the promoters have proposed to setup 5,000 Kg/ day of Bio-CNG (compressed biogas) along with 107 Kg/ day of Fermented Organic Manure.

2. SHAREHOLDING DETAILS:

As per the data available on MCA website, the company is having authorised capital is INR 5,00,00,000 and the paid-up capital is INR 90,00,000 on the date of last balance sheet dated 31.03.2024. The shareholding details of the company is mentioned below:

TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

S. No.	Nature of Shareholders	No. of Shares	% Holding
1	Jwala Bioenergy APS Denmark	8,99,996	99.99%
2	Ashok Benjamin Basil Attumaly	1	0.00%
3	Vikram Garg	2	0.00%
4	Devesh Gautam	1	0.00%
	TOTAL	9,00,000	100.00%

Source: Data/Information provided by the client.

3. KEY PROMOTER'S/DIRECTORS PROFILE:

Mr. Ashok Benjamin Basil Attumaly, Mr. Devesh Gautam and Mr. Prakash Chand Singla are the directors of M/s W2Jwala Bioenergy Private Limited as per information available on MCA and also promoters of the company. As per data/information provided by the client about the promoters & directors, below table illustrate the educational & professional experience of the promoters along with the Address, DIN and contact details:

(A) Directors/Promoters Details				
S. No.	Name	DIN	Age	Designation
1.	Mr. Ashok Benjamin Basil Attumaly	08130582	36	Director & CEO
2.	Mr. Devesh Gautam	10170164	-	Director
3.	Mr. Parkash Chand Singla	00586817	-	Director
(B) Education & Experience				
Mr. Ashok Benjamin Basil Attumaly		<ul style="list-style-type: none"> Appointed as Director on 19th June 2024. 		
		<ul style="list-style-type: none"> As per data/information shared by the client, Mr.Benjamin Attumaly is a 36-year-old energy professional based in Denmark, with over 13 years of experience in the energy and shipping sectors across India, Denmark, and the USA. 		
		<ul style="list-style-type: none"> A graduate of IIT Delhi (2010) and the University of New Orleans (2013), Benjamin combines technical expertise with global industry insights. Fluent in four languages, including Danish, he has lived in Denmark since 2015. 		
		<ul style="list-style-type: none"> His professional journey includes technical and commercial roles at leading global organizations like Siemens Wind Power, Bharat Petroleum, Maersk, and MAN Energy Solutions. At MAN, the world's leading ship-engine maker, as the Sales Manager for LNG retrofit projects, he sold more than €130 million worth of projects. 		

	<ul style="list-style-type: none"> He is the key promoter who has conceptualized and raised funds for Jwala Bioenergy.
Mr. Devesh Gautam	<ul style="list-style-type: none"> Appointed as Director on 19th May 2023. As per data/information shared by the client, Mr. Devesh Gautam is a director (one level below Partner) at Ernst & Young, where he is part of the Economic Development Advisory team for Government and Public Sector clients. He is a member of the Board of Directors of Jwala Bioenergy's SPV – W2Jwala Bioenergy Pvt Ltd. He is an IIT Delhi alumnus who worked in GATI's infrastructure projects in the North East states prior to joining EY, he brings his experience of managing policy stakeholders and navigating the regulatory environment.
Mr. Parkash Chand Singla	<ul style="list-style-type: none"> Appointed as Director on 10th July 2024. As per data shared by the client, Mr. Parkash Chand Singla is the father of Mr. Samar Singla, who is an IIT Delhi alumnus, and the founder of mobility start-up <i>Jugnoo</i>. Mr. Samar Singla is an investor in Jwala Bioenergy ApS and sits on the board of the company.

Source: Data/ Information provided by the company

Below tables shows the information of the companies/LLPs with which each Director is associated with to give a basic background detail of the promoters as found on public domain in general/ tertiary category research.

(MR. ASHOK BENJAMIN BASIL ATTUMALY DIN: 08130582)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of Appointment	Date Of Appointment at Current Designation	Date of Cessation
1	W2Jwala Bioenergy Private Limited (U35103PB2023FTC058577)	CEO	06/06/2023	-	-
2	W2Jwala Bioenergy Private Limited (U35103PB2023FTC058577)	Director	19/06/2024	19/06/2024	-
3	10Lane Seaways Private Limited (U40106UP2020PTC138480)	Director	-	10/05/2018	02/03/2021

Source: Information extracted from MCA website & public domain

(MR. DEVESH GAUTAM DIN: 10170164)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of	Date Of Appointment	Date of Cessation
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TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

			Appointment	at Current Designation	
1	W2Jwala Bioenergy Private Limited (U35103PB2023FTC058577)	Director	19/05/2023	19/05/2023	-

Source: Information extracted from MCA website & public domain

(MR. PARKASH CHAND SINGLA DIN: 00586817)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of Appointment	Date Of Appointment at Current Designation	Date of Cessation
1	G3 Worldwide Private Limited (U78300PB2023PTC059066)	Additional Director	07/12/2024	07/12/2024	-
2	Appvirality Technologies Private Limited (U72200TG2014PTC096860)	Additional Director	19/11/2024	19/11/2024	-
3	W2Jwala Bioenergy Private Limited (U35103PB2023FTC058577)	Director	10/07/2024	10/07/2024	-
4	Gourmet Chefs India Private Limited (U10790HR2024FTC124064)	Director	08/08/2024	08/08/2024	-
5	Jungleworks Software Private Limited (U72900CH2021PTC043984)	Director	23/08/2023	23/08/2023	-
6	Bistro Technologies Private Limited (U72900CH2015PTC035504)	Director	08/12/2022	08/12/2022	-
7	Click Labs Private Limited (U74900CH2011PTC035785)	Director	18/12/2018	30/09/2019	-
8	Radha Krishan Solvex Private Limited (U15143PB2003PTC025977)	Director	-	01/05/2003	22/07/2007
9	Click Labs Private Limited (U74900CH2011PTC035785)	Additional Director	-	15/01/2013	28/08/2015
10	Click Labs Private Limited (U74900CH2011PTC035785)	Director	-	28/08/2015	21/11/2017

Source: Information extracted from MCA website & public domain



PART D

PROPOSED INFRASTRUCTURE DETAILS

1. PROPOSED PLANT LOCATION:

The proposed Bio-CNG generating plant will be set up by M/s W2Jwala Bioenergy Private Limited at Village Jaulan Kalan, Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501, which is spread over an area of 11.73 Kille (~39,351.23 Square meters) as per the lease deed provided to us by the company.

The location of the plant is in the well-known agricultural area of Punjab, where accessibility of agricultural land for cultivating the paddy straw is sufficient. Availability of the required raw material is the advantage of the proposed location as many agricultural farms are situated near by the proposed site location.

During the site visit we found that the property is merged with adjacent plots and not demarcated till the date of survey done by us. The property is having the proximity to the civic amenities such as hospital is situated ~9 km away and market is situated ~3 km away from the proposed plant location.

Table: 1 is showing the details of the adjoining properties of the land for proposed CBG plant and Table: 2 is showing the Connectivity Details of the Proposed Location:

Table: 1 Adjoining Property Details	
Location	Details
East	Agricultural Land
West	Road (Entry Point)
North	G19 Brick Company
South	Agricultural Land

Table: 2 Connectivity Details of the Proposed Location	
Connectivity	Details
Road	Jaula Kalan Link Road - ~800 meters away
Rail	Dappar Railway Station - ~7.8 km away
Airport	Chandigarh Airport - ~29 km away

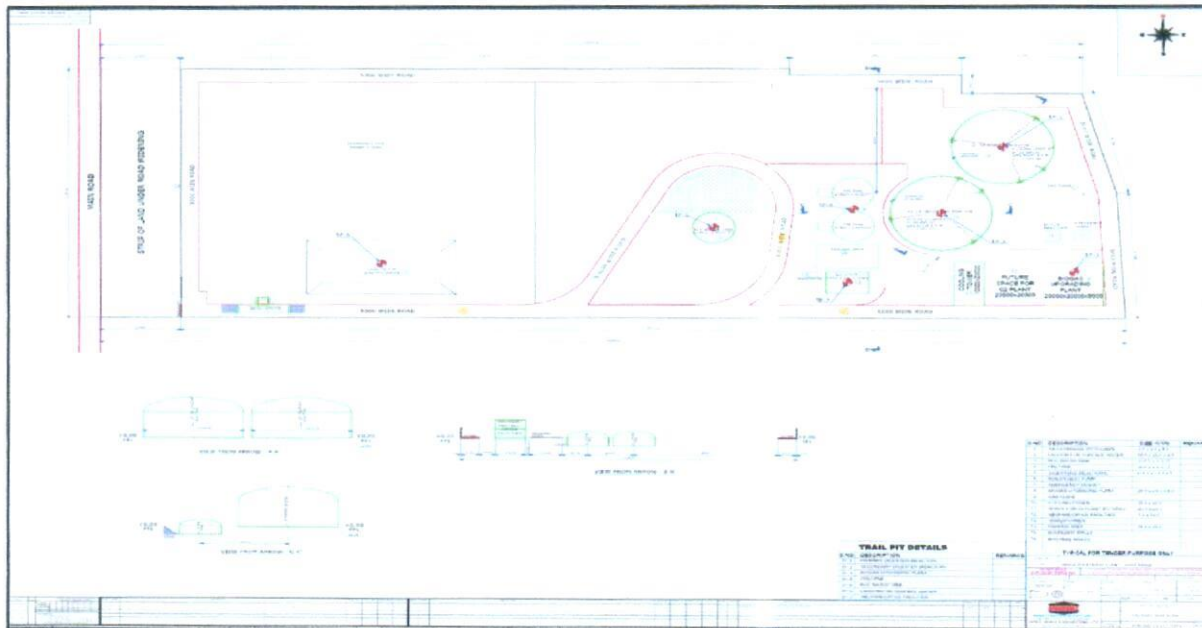
2. LOCATION MAP:

a) **Google Map Location:** The Bio-CNG plant is proposed to be commissioned at Village Jaulan Kalan, Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501 with GPS

TECHNO-ECONOMIC VIABILITY REPORT

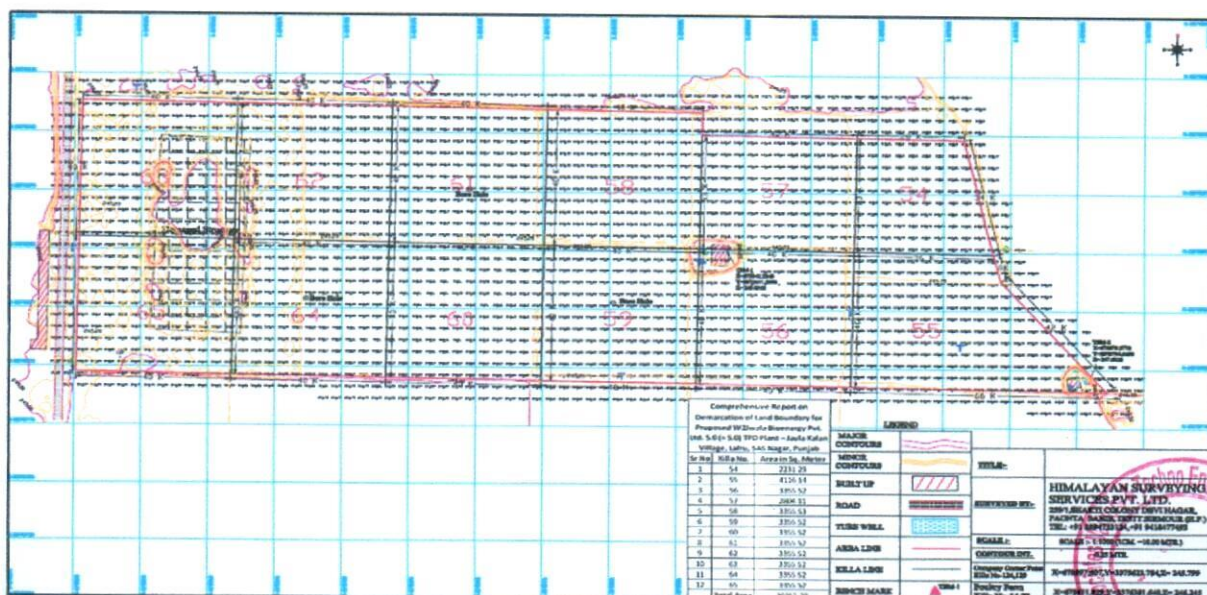
M/S W2JWALA BIOENERGY PRIVATE LIMITED

Area Development Authority (GMADA). For reference, proposed layout plan has been attached below:



4. LAND DETAILS:

As per the lease deed shared by the client/company, the promoters have leased 11.73 Kille of land at Village Jaulan Kalan, Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501. However, this is the "short kille" - which is used in districts of Patiala etc. which converts to 39,351.23 m². This land has been leased out in the name of M/s W2Jwala Bioenergy Private Limited for 16 years with an option of with an option of renewal of 10 years at the end of lease as per the shared lease deed executed on 27th September 2024, for setting up the proposed Bio-CNG plant. The Shazra map is shown in the image below:



During the site visit on 15th February 2025, we found it as a vacant land which was merged with the adjacent plots and the approach road which connects to the main road is narrow road of ~20 ft. wide. At the time of site visit, we found that the proposed land is not demarcated and work on the Project has not been started yet. As per informed by client, land development work will start soon.

5. SITE PICTURES:

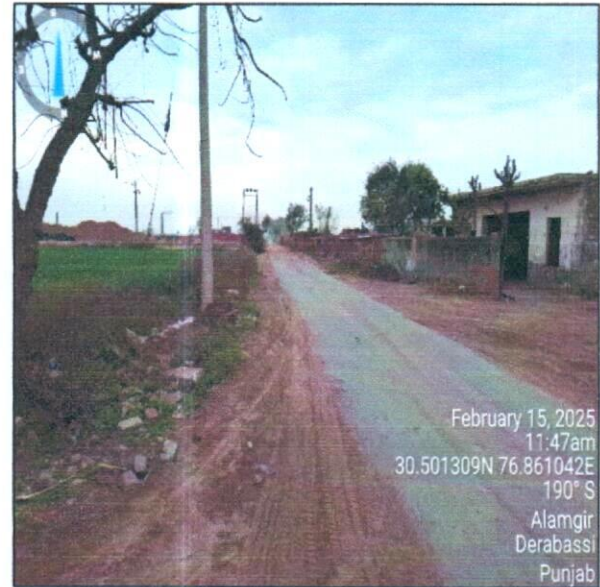
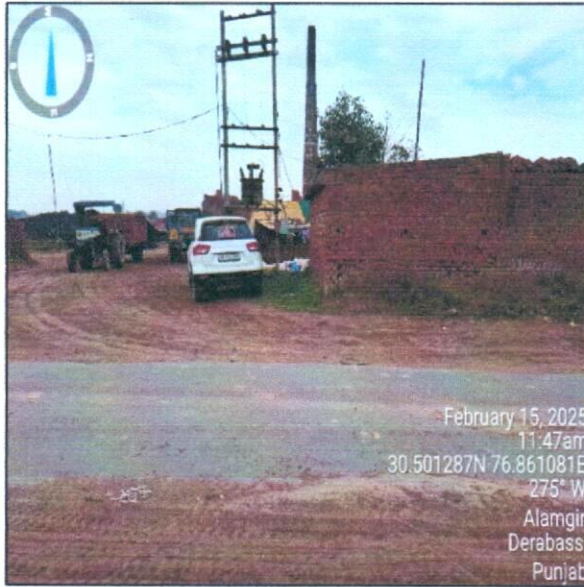
Site pictures were captured during the site survey on 15th February 2025, for reference few of the pictures are attached below:





TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED



6. BUILDING & CIVIL WORKS:

The Bio-CNG generating facility is proposed to be commissioned through appointment of the EPC. Company has executed a provisional contract agreement on 17th February 2025 and appointed M/s ISGEC Heavy Engineering Ltd as EPC contractor for implementation of the proposed plant. As per the scope of the agreement, EPC contractor will be supplying all civil & structural engineering required for the proposed plant.

Detailed bifurcation of the scope of work for the proposed Building & Civil works has been shown in the below table:

S. No.	Description	Qty./Area/Unit
1.	Digester (33.52 m dia., Height-12.0m) foundation	2 Nos.
2.	Pretank (Dia. 14.0m, Ht. 4.0m) - 2 Nos. complete in RCC Pre tanks shall have Epoxy lining inside	2 Nos.
3.	Water tank (Dia. 14.0m, Ht. 4.0m) - 1 No. complete in RCC	1No.
4.	Gas Flare Stack foundation	1No.
5.	Weigh Bridge (1 No.) foundation	1No.
6.	Weigh Bridge Room (1 No.) (3 x 3 m)	1No.
7.	Welfare / Office /MCC facilities (7mX14.0m) G + 1 floors	196 sqm
8.	Biogas upgradation shed (20mX20mx6.0m Ht.)	400 sqm
9.	Parking (21.0m X 11.0m) RCC considered	231 sqm
10.	Cooling tower (10.0mX20.0m) basin	200 sqm
11.	Lagoon (5000cum) Providing and laying dry brick soiling as per required camber and slopes, joints filled with sand Providing and laying HDPE film 500 microns thick with a minimum overlap of 150 mm thermowelded at joints to make a water proof membrane complete.	5000 cum
12.	Precast panels boundary wall having 1.8 m height	970 m
13.	Bitumen Road (2500sqm) and boundary roads (WBM) considered 2600 sqm & Drains (1000m)	Lot
14.	Miscellaneous foundations	1 Lot

Sources: Data/Information provided by the client.

According to the provisional contract with the EPC, the estimated cost for Building & Civil works is approximately **INR 8.65 crores**, inclusive of applicable GST. However, a detailed cost breakdown for civil and building works has not yet been provided, as the EPC is performing the construction on lump sum basis.

7. PLANT & MACHINERY/ EQUIPMENTS DETAILS:



As per the contract agreement executed on 17th February 2025 with EPC contractor, M/s ISGEC Heavy Engineering Ltd is expected to execute the rest of the plant (engineering, procurement, installation & commissioning) except Process-Provider (Sauter Biogas) scope items which would be directly procured by the Developer. Detailed bifurcation of the proposed Plant & Machinery as shared by the client/company has been shown in the below table along with the estimated cost:

Proposed Plant & Machinery						
S. No.	Equipment Name	Quantity	Manufacturer Name	Specification/ Capacity	Expected Landed Price (excluding GST) (INR Cr)	Current Status of Order
1	30T Weigh Bridge	1	Local	Capacity - 30T	0.1	Yet to be Ordered
2	Pre-Mix (Universal 4-in-1 solid feeder)	1	Vogelsang India Pvt Ltd	For feeding 80T of feedstock per day	1	
3	Bio Mixer Feed Mixer	1	Vogelsang India Pvt Ltd	Kombi-Mix 80-8 m ³ / 4t Kombi-Mix 120-12 m ³ / 6t	1	
4	GFS Digester Tanks	2	Rostfrie Steel Pvt Ltd	Material - Glass Fused Steel Ø inside 33.52 m - Clear wall height 12.05m - Capacity 10633m ³ gross - Capacity 9442m ³ net	5.2	
5	Thermal Insulation for Tanks	in kgs	Rockwool	- Polystyrene foam or glass wool (Thermal resistance-RD [(m ² ·K)/W] 2,35)	0.5	
6	Double Membrane Gas Holder Balloons	2	Baur Folien India Pvt Ltd	Roof shape / dome 1/5 - Diameter 33.52m - Variable gas storage volume appx 2561m ³ - Roof height 8.5m	1.8	
7	Sauter Core Process technology	1	Sauter Biogas GmbH	Steel container, screw pumps, heatexchanger, biomass piping, sprinkler system, valves, O2 generator, Solid-liquid seperators	10.4	
8	Mixer for Pre-Tank	2	WAM India	Power 15kWb drive and Gearbox	0.25	
9	Gas Flare	1	SCT	throughput capacity: 600m ³ /h	0.3	
10	Staircase around Digester Tank	2	Local	Spiral ladder (external) (MS - HDG, steps width 700 mm) with intermediate resting platforms	1.2	
11	Boiler/ Water Heater	1	ISGEC	Briquette based water heater considered. 90kg/Hr as Crushed briquette required	0.6	
12	Emergency DG Set	1	Kirloskar	500 KVA	0.5	
13	Biogas Upgrading System (Pumps, chiller, pipes,	1	GPS Renewables Pvt Ltd	500NM3/hr	6	

	valves, filters)					
14	Cooling Tower with Pumps & accessories	1	ISGEC	200m3/hr FRP Based	0.2	
15	Air Conditioners for Office Space	6	ISGEC	Split Acs of 1.5 Tons each	0.05	
16	Gas Piping System	in sqm	ISGEC	Combination of SS310 and HDPE piping	2	
17	Electrical System (Transformers, Cabling)	in sqm	ISGEC	11KV/.433 KV Substation MV/LV power and control cable for substation Illumination system for proposed plant along with one no. of 415V/400V, 100kVA, Dyn11, indoor mounted lighting transformer Complete earthing system (GI) for Compressed bio gas plant	1.9	
18	Fire Fighting Systems	in Kgs	ISGEC	fire pumps, portable fire extinguishers, fire hoses, Alarms, Hooters. TAC standard for critical sections	1	
19	Biomethane Regulator (BMR)	1	Sopan India	Decompressor - Offline Gas Chromatography Unit - Flare functionality in case of off-spec gas, Odourizer	0.5	
20	Air Compressor for LP Air	2	ISGEC	2 x 100 CFM screw type lubricated air compressors with air drier.	0.2	

Source: Data/information provided by the client.

As informed by the client, the plant & machinery are to be ordered after Financial Closure. The cost of Plant & Machinery has been considered as per the technical offer bid received from EPC Contractor (ISGEC) and technology provider (Sauter). The estimated cost for plant & machinery will be ~INR 42.66 crores including GST.

8. REASONING FOR COMPARATIVELY HIGHER PROJECT COST:

The 5TPD CBG project at Dera Bassi represents a strategic investment in advanced technology and infrastructure to ensure long-term efficiency, reliability, and sustainability. The key factors contributing to the higher capital expenditure include:

- Adoption of Advanced German Technology** – The project incorporates high-performance equipment from Sauter Biogas GmbH, a globally recognized leader in biogas solutions. This includes specialized screw pumps, a patented sprinkling system, solid-liquid separators, a technical pumping container with integrated SCADA control, and

a biological desulfurization unit. These components ensure high uptime, superior process control, and reduced operational risks.

2. **First-of-Its-Kind Patented Sprinkling System in India-** As informed by client, unlike conventional CBG plants relying on agitators and mixers, the Sauter system eliminates common mechanical failures, enhancing reliability and minimizing maintenance costs.
3. **Higher Initial Cost for Long-Term Gains** – While the ₹10.50-11.00 crore investment in Sauter technology is higher than industry norms, it guarantees 96% operational availability, significantly reducing efficiency losses faced by many Indian CBG plants operating at 50-60% of design capacity.
4. **Advanced Pre-Treatment System for Paddy Straw** – Integrating high-performance Vogelsang Biomixer and Universal 4-in-1 Pre-Mix System optimizes feedstock preparation, improving biogas yield and overall plant efficiency.
5. **Oversized Anaerobic Digester Tanks** – With tanks 1.5-2 times larger than conventional designs, the project enhances anaerobic digestion, ensuring higher and more stable gas production.
6. **State-of-the-Art Gas Processing & Grid Injection** – The facility features an advanced Bio-Methane Regulator, two-stage membrane purification for 95-98% methane purity, and a biological desulfurization unit to meet stringent CGD grid standards—surpassing the lower quality requirements of cascade delivery projects.
7. **Direct Gas-Grid Injection** – Unlike most Indian CBG projects that rely on cascade delivery, this project is among the first to integrate direct grid injection, requiring superior gas quality and additional infrastructure investment.
8. As part of its long-term risk mitigation strategy, the company has acquired or leased a larger land parcel of 39,351.23 sqm to accommodate on-site feedstock (straw) storage within the plant premises. The associated civil infrastructure costs—including the construction of internal roads, stormwater drains, boundary walls, firefighting systems for the feedstock storage area, and a 5,000-cubic-meter lagoon—constitute a significant component of the project's capital expenditure (CAPEX). However, this investment is expected to reduce operational expenditure (OPEX) over time by eliminating the need for external feedstock storage.

The higher capital expenditure of the Dera Bassi CBG project is a calculated investment in long-term efficiency, reliability, and sustainability. By prioritizing superior technology,

advanced pre-treatment, optimized digestion, and direct gas-grid injection, the project ensures maximum uptime, consistent gas yield, and lower lifecycle costs—positioning it as a benchmark for future CBG plants in India.

9. UTILITIES: Details of Water, Electricity and other utilities are described as below:

a. WATER:

During the site inspection, we have found that the underground water is available at the project site. Company has yet to take the "No Objection Certificate" for groundwater extraction from the concerned authorities. As informed by client, the water supply of local Jal Board is also available. The total requirement of the plant will be ~20 KL per day.

b. ELECTRICITY:

As per the data/information provided to us by the client, Company is yet to apply for sanction of power load. The estimated power requirement would be ~5048 Kwh per day to run the plant. The consumption of different components of the unit as described in the below table:

Parasitic Consumption Of Power	
Particular	Required Power
Load of Sauter Components	1,448 KWh/day
Load of Biogas Up-gradation Section & Recovery	3,360 KWh/day
Load of auxiliaries at Bio-CNG Unit	240.4 KWh/day
Total	5,048.40 KWh/day

Source: Data/information provided by the client



PART E

PROJECT TECHNICAL DETAILS

1. CAPACITY OF THE PROPOSED BIO-CNG UNIT:

This Bio-CNG generating plant is proposed to be set up with a designed raw biogas generation capacity of 12,000 M3/Day to generate the 5,000 kg/day Bio-CNG along with 8723 TPA of solid organic fertilizer as illustrated in the below table:

Capacity of the proposed Bio-CNG plant	
Particular	Capacity
Raw Biogas Plant Generation	12,000 M3/Day
Bio-CNG Plant Capacity	5,000 kg/Day
Fermented Organic Manure Capacity	107 Ton/Day

Source: Data/information provided by the client.

2. PRODUCTION PROCESS OF BIO CNG (CBG):

Biogas is commercially produced by a process called anaerobic digestion. The process involves breakdown of organic waste materials such as animal waste, food waste and industrial sludge to produce biogas and digestate. The latter is further treated to be used as a fertilizer. Anaerobic digestion process is carried out in a sealed, oxygen-free tank, also called an anaerobic digester.

The biogas produced is subjected to scrubbing, upgradation and compression processes to produce Bio-CNG (CBG). The present organic waste to biogas system operates in a Mesophilic process in continuous stirred tank reactor.

Bio-CNG or bio-compressed natural gas, also known as sustainable natural gas or bio methane, is a biogas which has been upgraded to a quality similar to fossil natural gas and having a methane concentration of 90% or greater. The process of bio-methanation consist of four steps i.e. Hydrolysis, Acidogenesis, Acetogenesis and Methanogenesis as described below:

a) HYDROLYSIS:

In the first step of hydrolysis, the pulped material is sent to the Hydrolysis Tank, where the organic matter is enzymolyzed externally by extra cellular enzymes such as cellulose, amylase, protease and lipase etc. of microorganisms. The pulveriser stimulates this step by converting solid waste into liquid form.

Bacteria start decomposition of the long chain of the complex carbohydrates, proteins and lipids into shorter parts. Proteins are split into peptides and amino acids and fats into fatty alcohols. Hydrolysis occurs in the two hydrolysis tanks which are maintained at a high temperature and provided with insulation.

Various types of bacteria are involved in the remaining three processes which occur in the two digester tanks, which are likewise maintained at high temperature with insulation and continuously stirred.

b) ACEDOGENESIS:

Acid-producing bacteria involved in the second step convert the intermediates of fermenting bacteria into volatile fatty acids along with ammonia (NH₃), hydrogen sulphide (H₂S) and Carbon-dioxide (CO₂). The pH of the raw slurry falls from 7.5 to about (4.5 to 5.5) in this stage.

c) ACETOGENESIS:

In Acetogenesis, bacteria which are aerobic and facultatively anaerobic, and can grow under acidic conditions, produce acetic acid, during which they use the oxygen dissolved in the solution or bounded oxygen. These bacteria largely convert the products of Acidogenesis into acetic acid (CH₃COOH) carbon-di-oxide (CO₂) hydrogen (H₂) and traces of methane. Various zones are formed in fermentation pond and different bacteria dominate these zones.

d) METHANOGENESIS:

A consortium of archaebacteria belonging to methanococcus group is involved in the fourth step and decomposes compounds with a low molecular weight. They occur to the extent that anaerobic conditions are provided, for instance under water (in marine sediments), in ruminant's stomach and in marshes. They are obligate anaerobic and very sensitive to environmental changes. They have very heterogeneous morphology and a number of common biochemical and molecular-biological properties that distinguish them from all other bacteria.

The heat used for maintaining the temperature of the slurry in the hydrolysis tank and the digester tank is recovered in a cooling tank with the help of a heat pump coupled to heat exchangers. The undigested lingo-cellulosic and hemi-cellulosic materials are then passed to the sludge separator which recovers solid organic fertilizer from it. This fertilizer is dried packed and sold to the farming community.

e) BIOGAS GENERATION:

The biogas produced is a mixture of methane, carbon dioxide water vapour and small quantities of contaminants such as H₂S NH₃ and N₂. The average composition of biogas is as follows:

Particular	Concentration
Methane (CH ₄)	50-60 %
Carbon dioxide (CO ₂)	36-40 %
Water vapour (H ₂ O) saturated mass	3- 4 %
Hydrogen sulphide (H ₂ S)	50-2500 PPM
Ammonia (NH ₃)	0-300 PPM
Non-gaseous particulates and oil	Low concentration

f) BIOGAS UPGRADATION:

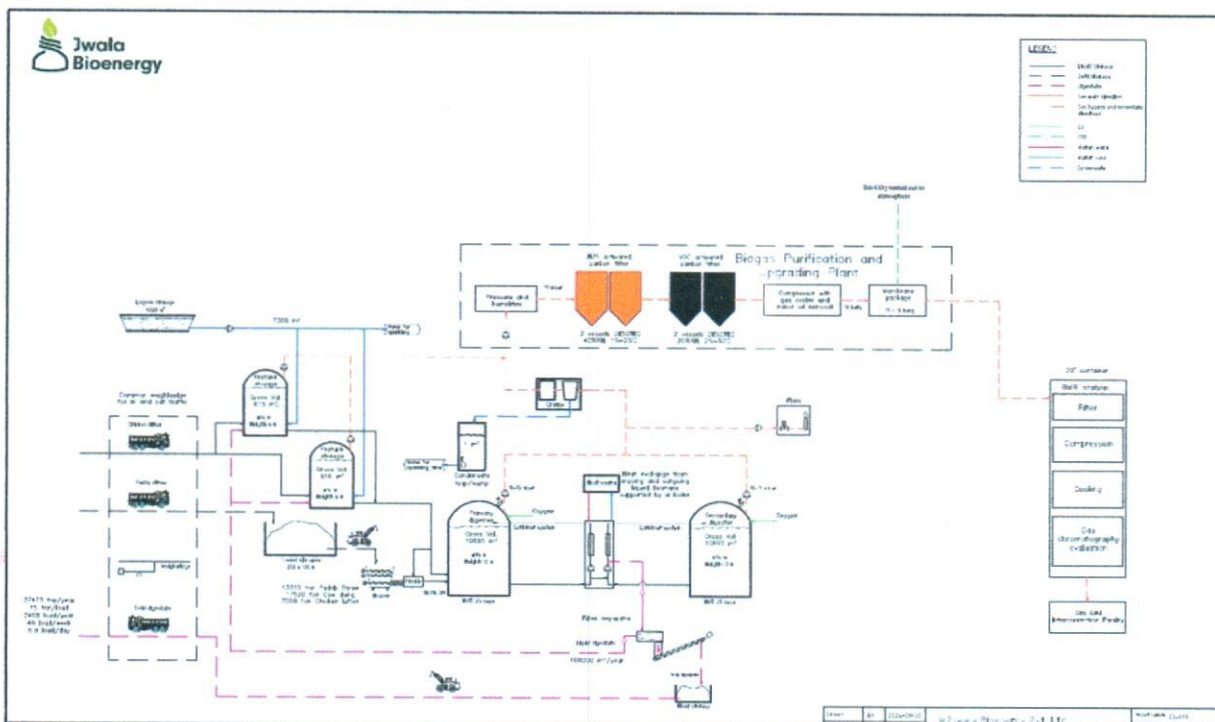
Biogas upgradation using membrane separation technology involves a multi-stage purification process to remove hydrogen sulfide (H₂S), moisture, and carbon dioxide (CO₂), producing high-purity Compressed Biogas (CBG). The process begins with H₂S removal through a catalytic reaction, where sulfur compounds are oxidized or filtered out to prevent corrosion and ensure compliance with gas quality standards. Next, moisture is removed in two stages—first by chilling, which condenses excess water, and then by desiccant adsorption, ensuring the gas is dry before further processing.

For CO₂ removal, the dried biogas is compressed using a Roots-type gas blower and passed through semi-permeable membranes that selectively allow CO₂, oxygen, and other smaller molecules to diffuse out while retaining methane. The system operates in multiple stages, maximizing methane purity (>95%) while minimizing losses. A recirculation mechanism further optimizes methane recovery, reducing methane loss to as low as 2-5%. Once upgraded, the CBG is pressurized and conditioned to meet City Gas Distribution (CGD) network specifications.

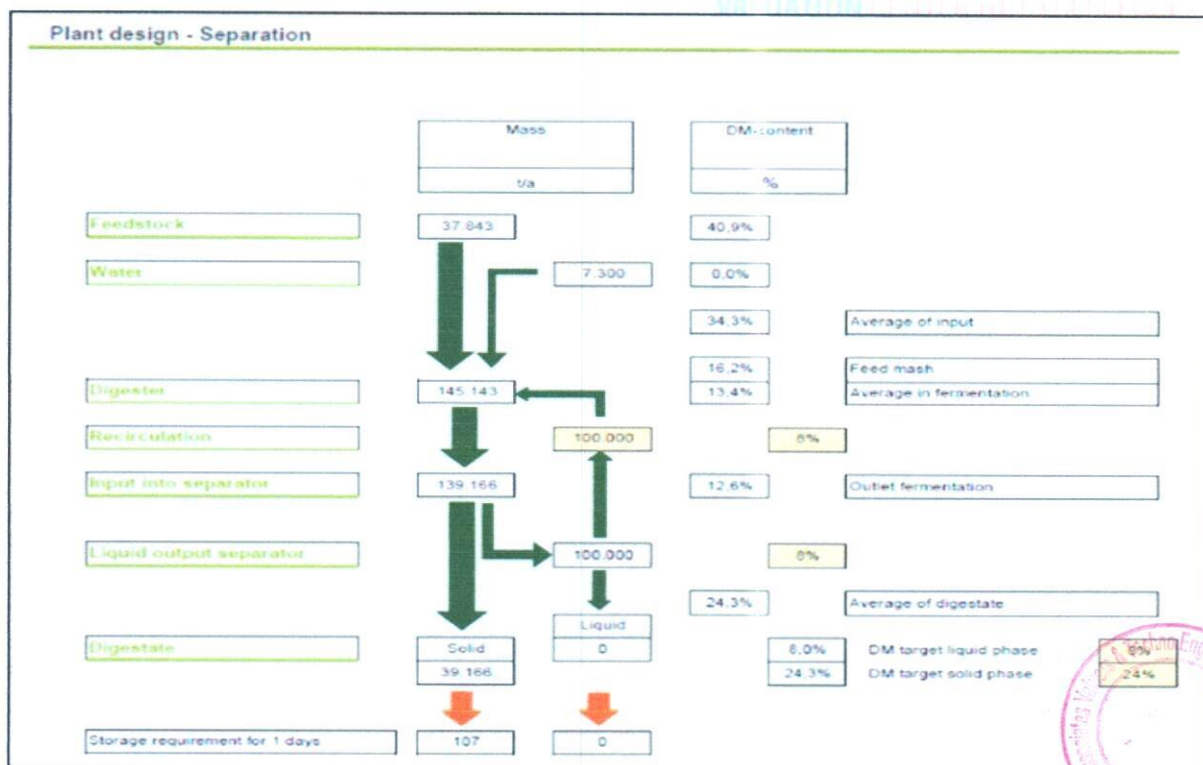
The entire process is fully automated using a Programmable Logic Controller (PLC), ensuring real-time monitoring, efficiency optimization, and seamless operation. Membrane separation technology is favoured for its low maintenance, energy efficiency, scalability, and minimal methane loss, making it an ideal choice for large and small-scale CBG production facilities. Biogas upgradation is the process of removing impurities like H₂S, Moisture and Co₂. The catalytic removal process is being used to remove H₂S. The moisture is being removed in two steps, first by the chilling process and second by the desiccant adsorption process. The removal of CO₂ is being done by a membrane separation system, a versatile and proven technology for gas separation. In this system,

the company will be using a selective membrane process where CO₂ is separated based on differences in permeability. The process involves four key steps: gas conditioning, selective permeation, CO₂ separation, and product gas collection.

3. PROCESS FLOW CHART OF THE PROPOSED BIO-CNG PLANT:



Source: Data shared by client



Source: Binding Offer Bid from Sauter Biogas GMBH dated 25.01.2025

4. TECHNICAL SPECIFICATIONS OF THE PROPOSED BIO-CNG PLANT:

The 5TPD CBG project at Dera Bassi integrates a well-established biogas technology solution designed by PlanEnergi and executed using advanced biogas processing technology from Sauter Biogas GmbH, a German industry leader.

The Sauter biogas concept has been successfully deployed in multiple projects across Germany and Denmark, demonstrating its effectiveness in handling straw and other solid feedstocks. This makes it particularly well-suited for the Dera Bassi project, which relies heavily on paddy straw as a primary feedstock. One of the largest Sauter-operated plants, located in Northern Jutland, Denmark, produces approximately 30 tonnes of methane per day, while also processing the highest percentage of straw-based feedstock in the country—validating the system's capability in similar operational conditions.

For biogas upgrading, the project incorporates a membrane purification system to refine biogas into pipeline-grade biomethane. Over the past several years, membrane-based upgrading has become the preferred technology in Europe due to its high reliability, efficiency, and lower energy consumption. Since 2017, more than 50% of new biomethane plants in Europe have adopted membrane systems, reinforcing their proven advantages in commercial-scale biogas operations.

As per the data/information provided by the client, below table shows the technical specification of the proposed Bio CBG generating plant:

Digester Tanks & Storage Tanks	<ul style="list-style-type: none"> • 2 primary digesters of approximately 10,895 m3 each. • At most, 13,500 tonnes of paddy straw will require storage. This will be stored in a storage area taking up 2.8 hectares of land. • Groundwater will be stored in a 600m3 Pretank.
Feeding of Material	<ul style="list-style-type: none"> • Feedstock processing system is simple and reliable. • Feedstocks are added using a side-mounted hopper attached to each primary digester. • Solids are mixed with liquids to make the solid feedstock pumpable. • Solid feedstock will be transported by its own wheel loader, while liquid material will be pumped directly.
Digestion Technologies	<ul style="list-style-type: none"> • Digestion temperature will be mesophilic in the range of 40-43 °C to aid in anaerobic digestion process of the feedstock. • Both digesters will be mounted with a double membrane gas

	holder.
	<ul style="list-style-type: none"> Each gas holder is expected to store approximately 2,300m³ of biogas in variable gas storage and 3,000m³ in total.
Gas Purification	<ul style="list-style-type: none"> Humidity is removed by the gas condensing in the pipes, leaving an ammonia rich condensate in the pipes. A O₂ micro-dosing system and Ferric compounds will also be used to reduce H₂S levels in the digester. VOC, the remaining H₂S and siloxanes will then be removed by activated carbon filters
Gas Upgrading	<ul style="list-style-type: none"> A membrane system will be used to upgrade the biogas to biomethane. Membranes have been used in over 50% of AD plants since 2017. Afterwards, the biomethane will then be compressed and sent to the gas grid via pipeline.

The present Bio-waste to Bio-CNG system operates on a two-phase mesophilic process. Technical specification of the proposed Bio-CNG plant is presented in the below table:

Biogas Plant Technical Specification			
S. No.	Characteristics	Values	Figures
1	Quantity of feedstock	Tons / day	125 to 130
2	TS% & VS%	%	As Per Given Data
3	Biogas Plant Design Capacity	M ³ / day	14,000
4	Biogas yield(Generation)	M ³ / day	12,762
5	Methane content CH ₄	%	55-60
6	Calorific value	Cal	4500-4708
7	Number of digesters	Pcs.	2
8	Digester volume (overall)	M ³	10895
9	Number of gasholders	Pcs.	2
10	Temperature in the digester	OC	40-42
11	Pressure in the digester	KPa	0.5
12	Overall dimensions of the digester (diameter / height) Approx.	Mt.	34/12
13	Solid fertilizers yield (70-80% wet)	Tons /Day	107
Biogas to Bio-CNG plant characteristics			
14	Biogas Upgrading Capacity	M ³ /hr.	700
15	Methane	%	>95-98
16	Booster Compressor	M ³ /hr.	350-400
17	electrical power Connected Load	KW	440
18	Total Electrical power Running Load	kW	345

5. TECHNOLOGY USED:

a) TECHNOLOGY SUPPLIER, EPC CONTRACTOR:

As per the contract agreement executed on 17th February 2025, M/s ISGEC Heavy Engineering Ltd has been appointed as the EPC contractor by the Company for commissioning the proposed Bio-CNG plant. As per the data/information provided by the client/company and available on public domain, ISGEC, a globally recognized engineering and construction firm, brings extensive experience in executing large-scale sugar plants, distilleries, refineries, and power projects. With a track record of delivering over 220 sugar plants, 900+ cane crushing mills, 800+ boilers, and 60+ power plants across 51 countries, ISGEC is well-equipped to handle complex EPC (Engineering, Procurement, and Construction) projects.

For the Dera Bassi CBG project, ISGEC has been appointed as the EPC contractor, responsible for the engineering, procurement, installation, and commissioning of all plant components, excluding the process technology and core equipment supplied directly by Sauter Biogas GmbH. The developer retains primary responsibility for securing permits, with ISGEC providing ad-hoc assistance or taking on delegated responsibilities as needed.

Given the specialized biogas technology involved, ISGEC will work in close collaboration with Sauter Biogas to ensure seamless integration, installation, and operational efficiency of the plant. The completed facility is designed to inject compressed biogas (CBG) directly into the City Gas Distribution (CGD) grid, facilitated by GAIL, in the Geographical Area of Chandigarh [GA-2.01] in the State of Chandigarh, Haryana, Punjab & Himachal Pradesh operated by Indian Oil-Adani Gas Private Limited under the terms of CBG-CDG Synchronization scheme.

The project uses PlanEnergi as Owner's Engineer and will employ the biogas solution provided by German Biogas firm Sauter. The company has an LOI with Sauter, and will sign the commercial agreement upon achieving financial closure as per the information shared with us. The contract draft proposed by Sauter Biogas GmbH also includes an assured raw gas production volume of 550 m³/hr (ref. Sauter quotation and contract proposal). Sauter Biogas GmbH is a globally recognized biogas plant developer, founded by Stefan and Norbert Sauter, with a legacy of innovation dating back to 1992, when they built their first biogas plant on the family farm. Over the decades, the company has pioneered several advanced biogas plant designs, with a strong focus on processing diverse organic residues.

The company's patented biogas system was first implemented in 2006, and since then, Sauter Biogas has developed over 50 plants across four continents, with capacities ranging from 75 kW to 6 MW. Their expertise spans the full spectrum of biogas project development, including:

- Consultation
- Planning and authorization
- Plant Construction
- Service

Sauter Biogas has successfully implemented high-efficiency plants across Europe and Asia, including:

- Vraa, Denmark (2017) – A 30 million Sm³/year biomethane facility with four digesters.
- Arnschwang, Germany (2011) – A 2.8 MW biogas plant.
- Ferrara, Italy (2019) – A 1.2 MW biogas plant.
- Malaysia (2018) – A 1 MW biogas plant.

Technological Expertise: Sauter Biogas specializes in handling a wide range of organic feedstocks, including slurry, manure, and paddy straw, making its technology particularly suitable for residue-based biogas projects like the Dera Bassi 5TPD CBG plant. Additionally, the company's energy-efficient irrigation system significantly reduces plant energy consumption, further enhancing operational efficiency.

b) PROPOSED TECHNOLOGY:

Jwala Bioenergy has implemented cutting-edge biogas technology from Sauter Biogas GmbH, a globally recognized leader in biogas solutions. This advanced system is designed to enable stable and efficient biogas production from paddy straw, a challenging feedstock that requires specialized handling.

A key advantage of the Sauter technology is its innovative reactor design, which operates without internal mechanical components such as heating hoses or stirring systems. This eliminates common failure points, significantly reducing maintenance needs while enhancing long-term reliability and operational efficiency. By minimizing mechanical interventions, the system ensures higher uptime and consistent gas yields, making it an exceptionally robust solution for commercial-scale biogas production.

The biogas technology implemented by Jwala Bioenergy, in collaboration with Sauter Biogas GmbH, has a proven track record in the Danish and broader European biogas markets for processing straw-based feedstocks. With over 50 reference plants across Europe, Africa, and Asia, Sauter Biogas has demonstrated its expertise in delivering high-efficiency biomethane solutions.

A key innovation in this technology is the "Sprinkled, not stirred! ®" system, which ensures optimal mixing of straw inside the reactor without the need for mechanical agitators. This enhances digestion efficiency, leading to higher biogas yields while reducing maintenance requirements.

Following the digestion process, the biogas is purified using an advanced membrane system, resulting in biomethane (CH₄) with a concentration of 95-98%. This high-purity biomethane meets regulatory standards for direct grid injection, ensuring compliance with stringent quality requirements.

With a strong foundation in proven European biogas technology, Jwala Bioenergy's partnership with Sauter Biogas ensures efficient, reliable, and high-yield biomethane production. The use of patented mixing technology and advanced gas purification systems positions this solution as a benchmark for straw-based biogas projects worldwide.

6. LATEST TECHNOLOGY/TECHNOLOGICAL ASSESSMENT:

Empirically, biological methanation of H₂/CO₂ has been tested for 151 days in a CSTR with no nutrients added. It is found that the Maximum CH₄ yield was 355.8 mL/(L·d) at a CH₄ content of 94.8% and Maximum CH₄ content was 99.5% at a CH₄ yield of 249.3 mL/(L·d), however, reactor ran stably at a pH around 8.5, and CO₂ flow was adjusted for pH control.

Hence, the CSTR is found as a historically proven and well-established technology. ~95% of the currently used bioreactors are of CSTR-type due to providing effective mixing to obtain efficient gas-liquid mass transfer. Applying CSTR in biological methanation is conducive to the application of existing equipment and reliable technology.

Thus, as per the above technical assessment, M/s W2Jwala Bioenergy Pvt Ltd is using the appropriate technology which is a going on, recognized and trending in the market at present. It can be commented positively that the plant will be running smoothly. Technology & specification of the plant are matching with the need to run the plant smoothly and achieve the economies of scale.

Jwala Bioenergy's adoption of Sauter Biogas technology reinforces its commitment to high-performance, low-maintenance, and sustainable biogas production. This strategic approach ensures greater efficiency, reduced downtime, and long-term operational success, positioning the company as a leader in advanced CBG technology adoption.

7. EFFLUENT TREATMENT AND ABETMENT:

a) EFFLUENT TREATMENT APPROACH:

The philosophy underlying the effluent treatment system is predicated on the sustainability principles of renew, reuse, recycle and recover. The thrust is to use renewable resources, reuse "wastes" recycle valuable inputs such as water, energy and nutrients and recover through energy efficiency initiatives energy otherwise lost.

b) PRODUCTION PROCESS:

The biogas plant generates about 12,000 m³/ day of biogas, which consists of 55-60 % methane, 36-40% CO₂ and 2-5% water vapour, and contains about 1% of contaminants such as hydrogen sulphide (H₂S) Ammonia (NH₃) and N₂ which are removed in the gas cleaning train. The cleaned gases, which contain ppm levels of the contaminants, are injected directly into the gas grid pipelines of CGD companies. This can be used as cooking fuel replacing PNG(D)/ LPG or a transport fuel in CNG pumps.

c) DISPOSAL OF THE BY-PRODUCTS:

Fertilizer by-products: The plant generates about 37,450 TPA of fermented organic manure from the sludge separator. This is sold as fertilizer in the market. These comply with the government's FOM standards in the FCO as amended in the Extraordinary Gazette dtb May 29, 2023.

Recycled Slurry/Water: The digested slurry after process from solid liquid separator will be reused in mixing tank as live feedstock. This is mixed with the incoming fed in the hydrolysis holding tanks.

8. TESTING STANDARDS FOR PRODUCTION:

In India, the testing standards for Compressed Biogas (CBG) are primarily governed by the Bureau of Indian Standards (BIS), Ministry of New and Renewable Energy (MNRE), and other regulatory bodies. The key standard for CBG is IS 16087:2016, which specifies the quality requirements for biogas used as a fuel. Below are the main parameters and standards applicable to CBG in India:

a) BIS Standards

- **IS 16087:2016** – Specifications for Biogas (Methane Content, Moisture, and Impurities)
- **IS 15958:2020** – Guidelines for Bio-methanation
- **IS 17393:2020** – Purification and Bottling of Biogas

b) Ministry of Petroleum & Natural Gas (MoPNG) – SATAT Initiative

- "Sustainable Alternative Towards Affordable Transportation (SATAT)" program mandates quality standards similar to Compressed Natural Gas (CNG).
- Guidelines align with IS 16087:2016 and specifications for injection into city gas distribution (CGD) networks.

The following parameters will be tested for "PNGRB Gas Quality Specifications - Threshold Limit for gas parameters on City or Local Gas Distribution Networks":

Parameters	Limit
Hydrocarbons dew pt (Degree Celsius, max.) *	0
Water dew pt (Degree Celsius, max) *	0
Hydrogen Sulphide (ppm by wt. max.)	5
Total Sulphur (ppm by wt. max.)	10
Carbon dioxide (mole % max.)	6
Total inerts (mole %)	8
Temperature (Degree Celsius, max.)	55
Oxygen (% mole vol. max.)	0.2

The testing of compressed biogas involves:

1. **Gas Chromatography (GC)** – To analyze CH₄, CO₂, and O₂ content.
2. **Moisture Analyzer** – To determine the water content.
3. **H₂S Analyzer** – To check hydrogen sulfide levels.
4. **Gas Purity Testing** – Ensures the removal of contaminants.
5. **Calorific Value Measurement** – Determines the energy content.
6. **Compression and Storage Testing** – Ensures compliance with pressure and storage norms.

As per communicated by client, company will be having a quality control Laboratory, wherein, they check the entire range on defined parameters like design, quality and finish. The unit is proposed to be equipped with all the essential tools, machine, and technology in order to ensure the production quality as per the standard benchmark.

9. MANPOWER:

As per information shared by the client/company, Jwala Bioenergy Private Limited is planning to outsource the Operations & Maintenance (O&M) of its biogas plant to a third-party service provider, which is yet to be finalized. As part of this arrangement, the selected service provider will be responsible for managing all aspects of plant operations, maintenance, and associated activities.

Additionally, all manpower requirements for the plant, including skilled and unskilled personnel, will be fulfilled by the outsourced service provider. Jwala Bioenergy Pvt. Ltd. will oversee the performance and compliance of the third party to ensure smooth and efficient operations while adhering to all regulatory and safety standards.

This strategic decision aims to enhance operational efficiency, optimize resource utilization, and ensure the long-term sustainability of the biogas plant. Further details regarding the service provider selection and contractual terms will be finalized in due course.

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PART F

PRODUCT PROFILE

1. INTRODUCTION:

CBG has calorific value and other properties similar to CNG and hence can be utilized as green renewable automotive fuel. Thus it can replace CNG in automotive, industrial and commercial areas. Ministry of Road Transport and Highways, Government of India had permitted usage of bio-compressed natural gas (bio- CNG) for motor vehicles as an alternate composition of the compressed natural gas (CNG).

The compressed biogas, or Bio-CNG, is likely to play a crucial role in promoting India's transition to a sustainable energy ecosystem. Bio-CNG is a green renewable automobile fuel with calorific value and other qualities similar to compressed natural gas (CNG).

2. PRODUCT CATEGORY:

a) BIO CNG:

The proposed plant will be generating 5,000 Kg/ day of Bio-CNG which has a gross calorific value of 8126.222 KCal/SCM. Methane is the most valuable component under the aspect of using biogas as a fuel; the other components do not contribute to the calorific value and thus are "washed out" in the purification plants in order to obtain a gas with almost 95-98% CH₄. Methane is the flammable compound in biogas. Composition of the purified Bio-CNG has been shown in the below table:

Composition of Purified Bio-CNG		
Ingredient	Value	Standard
CH ₄ (Percentage)	>90%	IS 16087:2016
CO ₂ + N ₂ + O ₂ (Percentage)	10 %	IS 16087:2016
Only CO ₂	4 %	IS 16087:2016
O ₂ (Percentage)	0.5%	IS 16087:2016
H ₂ S (Mg/M ³)	20 (Mg/M ³)	IS 16087:2016
Moisture (Mg/M ³)	5 (Mg/M ³)	IS 16087:2016

Source: Data/information provided by the client.

Bio-CNG, a clean and renewable fuel, has vast potential in India. It can be a supplement to petroleum products, if used in compressed form in the cylinders. Biogas originates from bacteria in the process of biodegradation of organic material under anaerobic conditions.

Bio CNG is having the applicability in various Industries and used as Automobiles Fuel. It is capable to be used in Canteens, Restaurant, Hotels, Sweet shop, Dhabas etc.

Equivalent Quantity Of Fuel For 1 Cu M Of Biogas	
Equivalent	Value
Biogas	1.00 M ³
Kerosene	0.620 Liter
Fire wood	3.474 Kg
Charcoal	1.458 Kg
Butane	0.433 Kg
LPG	0.456 Kg
Electricity	1.5 Kwh

Biogas supplied at Delivery Point, for injection in the pipeline network of Buyer, shall meet following PNGRB specifications (as amended) for natural gas in CGD networks:

PNGRB gas Specifications for Pipeline supply	
Schedule – VI	
(See Regulation 7(1))	
Threshold limit for gas parameters on City or Local Natural Gas Distribution Network	
Parameters	Limit
Hydrocarbon dew point (Degree Celsius, max.)	0
Water dew point (Degree Celsius, max.)	0
Hydrogen Sulphide (ppm by wt, max.)	5
Total Sulphur (ppm by wt, max.)	10
Carbon dioxide (mol%, max.)	6
Total inerts (mol%)	8
Temperature (Degree Celsius, max.)	55
Temperature (Degree Celsius, min.)	10-20
Oxygen (% mol. vol. max.)	0.2
Wobbe Index (for domestic consumers), MJ/SCM	39-53

A critical aspect of pipeline specifications is the stringent control of gas composition, including ultra-low hydrogen sulphide (H₂S) levels (<5 ppm), oxygen content below 0.2% mol vol, and low moisture levels (dew point of 0°C or lower). Additionally, the Wobbe Index serves as a key indicator of methane content, with Indian City Gas Distribution (CGD) companies typically requiring a Wobbe Index of 46 or higher, corresponding to a methane content of 95% or more.

b) ORGANIC FERTILIZER:

One of the major by-products of a Compressed Biogas (CBG) plant is digestate, a nutrient-rich organic by-product. This falls under the classification of Fermented Organic Manure (FOM) as per order dt. May 29, 2023 Digestate is the material left after anaerobic digestion of organic waste, such as agricultural residues, food waste, and animal manure. It is used as an organic soil conditioner and fertilizer. The choice of input feedstocks - rice straw, cow dung and poultry waste were purposely chosen so as to ensure a higher nutrition in the residues than purely rice straw.

The plant has a capacity to produce 37,450 TPA of solid organic fertilizers. The material drawn from the digester is called Organic Carbon Enhancers as per GoI/ MoAFW notification SO.897(E) dated 17 Feb 2025, which is rich in nutrients (ammonia, phosphorus, potassium, and more than a dozen trace elements) and is an excellent soil conditioner.

Quality of Organic Manure: The C:N ratio of organic manure is between 12:1 to 16:1. It is a good source of nitrogen, phosphorous, potassium and iron. The composition of digestate varies depending on the feedstock used in the CBG plant, but it generally contains:

Elemental Composition of Organic Manure	
Calcium (Ca)	1-3 %
Carbon (C)	35-50%
Magnesium (Mg)	0.2-1.5%
Sulphur (S)	0.2-1%
Nitrogen (N)	1.5-4%
Phosphorous (P)	0.5-2%
Potassium (K)	1-5%

In other words, one ton of organic manure provides 44 kg of nutrients as compared to 19 Kg through farmyard manure and 27 Kg by compost. Micro nutrients such as zinc (Zn), copper (Cu) and manganese present in the original material are also recovered in biogas slurry and can proved useful to crops when used as organic manure.

The organic manure is recommended for Short term crops such as vegetables and fodder, Mid-term crops such as wheat, cotton, rice, potato, sugarcane and maize and Long term crops such as kinnow, guava, grapes, mango, lemon and apple as per the shown inbelow table:

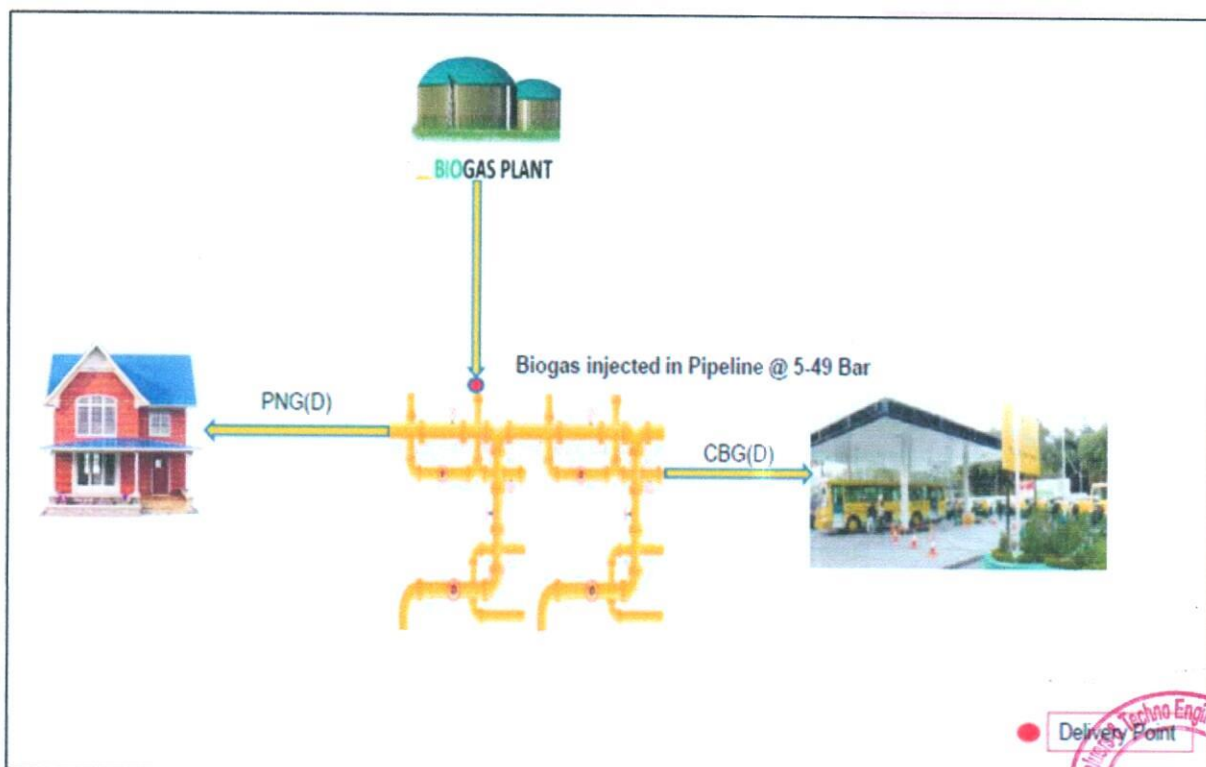
Application of organic manure

Crop	Doses	Time of application
Wheat, Rice, Maize and Cotton	200-400 Kg/Acre	During preparation of Land for Sowing
Sugarcane, Potato	400-800 Kg/Acre	Half Dose of Manure during preparation of Land and remaining half after two-three months of sowing
Vegetable	200-400 Kg/Acre	20-30 Days after plantation
Kinnow, Guava, grapes, Mango, Lemon and Apple.	5-10 Kg/tree	Two times in a year

To derive maximum benefits from the stored digested slurry, it is essential to prevent its exposure to the sun as any such exposure would result in loss of ammoniacal nitrogen content of the slurry. It is advisable to dig, two or three manure pits near the biogas plant. The slurry is then carried and stored in these pits which are covered with solid waste from the farm. The fresh biogas slurry when used by mixing with irrigation water to growing crops gives better yields as compared to other modes of its applications.

3. PRICING STRATEGY:

On 18th February 2025, the company has signed a Purchase/LOI/Tripartite Agreement (W2Jwala Bioenergy Private Limited, Indian Oil-Adani Gas Private Limited (IOAGPL) and GAIL). (Ref No.: **WBPL-IOAGPL (GA-2.01)-GAIL dated 18.02.2025**). GAIL purchases Biogas/CBG from producers and sells to CGD entities across India along with APM/NAPM gas at Uniform Base Price (UBP) for use in PNG (D) & CNG (T) segments.



The current selling rate of CNG at OMC outlets in Punjab is around INR 87.58/kg. (<https://www.goodreturns.in/cng-price-in-punjab-s27.html>), however the procurement price of Bio-CNG from Indian Oil as per the SATAT Scheme is around @INR 66.67 per kg without GST. "CBG Pricing Circular- SATAT Scheme" is attached below for reference:

Ref: CO/AE&SD/01
Date: 20.05.2022

To
Stakeholders of SATAT Scheme
Sub: Purchase price of Compressed Bio-Gas (CBG) under SATAT scheme

You are kindly aware that, 'SATAT' (Sustainable Alternative Towards Affordable Transportation) scheme on CBG was launched on 1.10.2018. As per the scheme, procurement price of CBG purified as per IS 16087: 2016 standards, compressed at 250 bar pressure and delivered to OMC Retail Outlets in cascades (up to 25 km one way distance from CBG Plant) was fixed at Rs. 46/kg + applicable taxes for period from 1.10.2018 to 31.3.2024. It was also informed that minimum procurement price will not be lower than Rs. 46/kg + applicable taxes up to 31.3.2029.

To facilitate entrepreneurs for financial closure of the projects as well as promote setting up of CBG Plants, it has been decided that the CBG prices shall be indexed to the prevalent Retail Selling Price (RSP) of CNG in the market (or CBG RSP for markets where CNG is not available).

Accordingly, the following revised procurement pricing of CBG shall be implemented:-

- 1.0 The minimum procurement price of CBG will not be lower than Rs. 46/kg + applicable taxes for the period up to 31.3.2029.
- 2.0 The Retail Selling Price of CBG in a market shall be at par with RSP of CNG (as provided by the authorized CGD entity).
- 3.0 The following slabs for CBG procurement price have been decided, which will be the procurement price of CBG delivered at IndianOil Retail Outlet situated at any distance (up to 75 km one way) as per IS 16087 2016 specification (or its latest version) and compressed at 250 bar pressure: -

S No	Lower Retail Selling Price of CBG in Slab including tax Rs./kg	Higher Retail Selling Price of CBG in Slab including tax Rs./kg	Procurement price of CBG Without GST Rs./kg	Procurement price of CBG With GST Rs./kg
1	Retail Selling Price of CBG up to 70		54.00	56.70
2	70.01	75.00	55.25	58.01
3	75.01	80.00	59.06	62.01
4	80.01	85.00	62.86	66.01
5	85.01	90.00	66.67	70.01
6	90.01	95.00	70.48	74.01
7	95.01	100.00	74.29	78.01

Note: The above table is applicable strictly for supply of CBG at a one-way distance up to 75 km from the CBG Plant. For distance beyond 75 km, the price will be first adjusted as defined in para

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पंजीकृत कार्यालय : इंडियन ऑयल भवन, जी-9, अली यावर जंग मार्ग, बान्द्रा (ई.), मुम्बई - 400051, महाराष्ट्र (भारत)
Regd. Office : IndianOil Bhawan, G-9, Ali Yavar Jung Marg, Bandra (E), Mumbai - 400051, Maharashtra (India)
CIN : L23201MH1959GOI011388

As informed by client, the organic digestate produced from the plant could comply with Fermented Organic Manure (FOM) for which the central government announced comprehensive guidelines to offer market development assistance (MDA) at INR 1500/MT (1.5 RS / Kg) for fermented organic manure (FOM) or bio-digestate derived from compressed biogas generating facilities. (Ref: <https://pib.gov.in/PressReleasePage.aspx?PRID=1935893>).

As the by-product produced from the plant would come under the definition of FOM as per the government guidelines, especially the FCO amended dated May 29, 2023, that allowed moisture of up to 70% for FOM. At present, the company does not have any formal agreement with Farmers/FPO but is working with an NGO namely RGR cell of TATA group to formalise the same. The company is building a supply chain for paddy straw from farmers to the plan in cooperation with the NGO. The company to build a reverse supply chain of supply FOM to the farmers tapping into the same channel via the NGO as the farmers sending paddy straw would also be recipients and beneficiaries of the FOM.

As per our tertiary research about the current market scenario, the fermented organic solid manure/fertilizer is sold to farmers or outlets at around INR 6.00 to 7.00 per kg including with packing and bagging facilities. Whereas the bulk-selling rate of solid fermented organic manure/fertilizer is around 4.00 to 5.00 per kg.

Further, The Indian Biogas Association (IBA) has recommended a fair and remunerative price of Rs 5.5 per kg for fermented organic manure (FOM), excluding the government incentive of Rs 1.5 per kg, to support biogas plants in the country. The IBA has suggested that the Ministry of Chemical and Fertilizer administer a fair market price for FOM, with an additional allowance for logistics and transportation charges.
<https://economictimes.indiatimes.com/industry/indl-goods/svs/chem-/fertilisers/fix-fair-remunerative-price-of-rs-5-5/kg-for-fermented-organic-manure-indian-biogas-association/articleshow/103100564.cms?from=mdr>

The IBA suggested a 'floor market price' at par with the Urea Retail Prices (presently at Rs 242 per 45 Kg bag), i.e., approx. Rs 5.5 per kg (exclusive of taxes). The market development Assistance (MDA) of Rs 1.5 per kg shall be realized over and above the floor market price by the FOM producer.

As IBA suggested the floor market price should have additional leeway to accommodate for additional logistics and transportation charges, if incurred and suggested an additional rate of approx. Rs 50/ton/km. According to the IBA, FOM is being sold at a rate ranging from Rs 0.50 to 4.50 per kg in the country. The selling price of Bio-CNG is considered on conservative side as INR 64.20/kg (excluding compression charges of INR 2/kg). The selling rate of FOM has been built at a conservative assumption of Rs 1500/ton when the government's MDA gives pricing support of Rs 1500/ton.

4. MARKETING, SELLING & DISTRIBUTION PLAN:

a) BIO CNG:

As per data shared with us, the Bio-CNG produced has to be sold to GAIL by directly injecting it in the Pipeline Network of CGD thru tie-in pipeline of 9 km as per the information shared by the client/company, for which the company have already secured a Purchase Agreement/LOI/Tripartite Agreement (**Ref No. - WBPL-IOAGPL (GA-2.01)-GAIL dated 18.02.2025**).

As informed by client, the company have 50% Take-Or-Pay on the contract volume, although the contract is not yet signed regarding this. As per client, the contract is expected to be fully executed by Jwala Bioenergy, GAIL and IOAGPL by the time of the

submission of this report to the bank. Hence, we recommend the bank to suggest the client to submit a signed agreement with 50% take-or-pay clause to ensure contractual certainty and risk mitigation.

b) ORGANIC FERTILIZER:

The by-product of the biogas generation process is enriched organic digestate, which is a perfect supplement to, or substitute for, chemical fertilizers. As per informed by the client, the organic solid bio-fertilizers are in demand as a replacement for chemical fertilizers and are to be directly marketed using appropriate channels to the farming communities and sold @ INR 1.50/Kg.

One of the strategic goals of the tie-up with RGR Cell (TATA Trusts NGO) is intended to create a strong community demand for the digestate (FOM). The community would be educated on the benefits of using FOM vs. chemical fertilizers.

There is a daily traffic of 5 trolleys of cow dung (50T) and 2 trolleys of poultry droppings (20T). The FOM would be supplied back to the villages via resellers in these trolleys. It is to be noted that the above is a developer's own market development initiative, already underway even before plant construction.

This is over and above the efforts of the government, where Market Development Assistance (MDA) programs have been introduced, with minimum support prices (Rs 1500/MT) announced and PSU fertilizer companies roped in to market FOM.

Considering the own efforts of the developer and the government's efforts via MDA programs, along with its conservative pricing (Rs 1500/MT), the organic fertilizer (FOM) from Jwala Bioenergy's plant is expected to be fully offtaken.



PART G

FEEDSTOCK ANALYSIS

1. INTRODUCTION:

Bio-Methane from Anaerobic Digesters (AD): Anaerobic processes could either occur naturally or in a controlled environment such as a biogas plant. Organic waste such as livestock manure and various types of bacteria are put in an airtight container called digester so the process could occur. Depending on the waste feedstock and the system design, biogas is typically 55 to 60 percent pure methane. The state-of- the-art systems report producing biogas that is more than 95 percent pure methane.

The primary component of an AD system is the anaerobic digester, a waste vessel containing bacteria that digest the organic matter in waste streams under controlled conditions to produce Bio-methane. As an effluent, AD yields nearly all of the liquid that is fed to the digester. This remaining fluid consists of mostly water and is recycled to flush manure from the swine building to the digester.

Approximate Quantity Required for Generation of One M ³ Biogas		
S. No.	Substance	Quantity (Kg)
1	Cattle Dung	20
2	Paddy Straw	4
3	Napier grass	8
4	Poultry Waste	8
5	Horse/ Mule/ Elephant Dung	12-15
6	Food waste: Pre and post cooked leftover food from households, hotels and canteens.	10-12
7	Green waste (vegetable market waste): Vegetable Refuses from Vegetable Markets or kitchens.	10-12
8	Paddy straw/ wheat straw/ mushroom spent waste: Lawn cuttings, leafy biomass, dried flowers, finely chopped and ground straw or bagasse.	5-8
9	De-oiled rice bran	3-4
10	De-oiled seed cake (Pongamia/ Jatropha)	3-4
11	Segregated municipal solid waste (biodegradable)	12-15
12	Slaughter house waste	5-10

Approximate Required Quantities of the Substances (Alone)		
Sr. No.	Item	Daily Required Quantity (Ton)
1	Cow Dung	250
2	Poultry Droppings	98-100
3	Food Waste	175-180
4	Paddy Straw	130-150

Combination of any of these mentioned above can also work in proportionate quantity. However, as per feed stock analysis the CBG plant will be using the following Combination of Raw Materials, while it should be noted that the feed stock quantity may very base on dry matter and volatile matter available in the below mention combination of feed stock:

Proposed Combination of Raw material		
S. No.	Item	Daily Input Quantity (Ton)
1	Cow Dung Required	~50
2	Paddy Straw	~38
3	Poultry Droppings	~20

2. PADDY STRAW:

Paddy straw is an abundant agricultural residue generated after rice harvesting. It typically has a moisture content of 10-15% and its chemical composition varies depending on rice variety, soil conditions, applied nutrients, and environmental factors. Due to its high lignocellulosic content, paddy straw presents a significant opportunity for biogas production through anaerobic digestion.

The methane potential of paddy straw is approximately 220–250 m³ per ton, making it a valuable raw material for biogas plants. The typical composition of paddy straw is provided below:

Composition Of Press Mud	
Components	Percentage
Cellulose	35-45%
Hemi cellulose	20-25%
Lignin	15-20%
Protein	3-4%
Wax	15-18%
Sugar	12-16%
Na	0.1-0.3%

Given its high proportion of biodegradable organic matter, paddy straw serves as an excellent feedstock for biogas production. The primary energy-yielding component is

methane (CH₄), which accounts for the calorific value of biogas. During purification, non-combustible gases are removed, resulting in a high-purity methane output of 97-100% CH₄, making it a sustainable and renewable fuel source.

By utilizing paddy straw for biogas production, significant environmental benefits can be achieved, including the reduction of stubble burning, mitigation of air pollution, and enhancement of sustainable energy generation

3. COW DUNG:

About one cubic foot of gas may be generated from one pound of cow manure at around 28°C. This is enough gas to cook a day's meals for 4-6 people in India. About 1.7 cubic meters of biogas equals one Litre of gasoline. The manure produced by one cow in one year can be converted to methane, which is the equivalent of over 200 Litres of gasoline. In the state of Uttarakhand, million tons of animal dung is produced every year which can be utilized for better purposes. Hence, anaerobic digestion becomes a promising technology.

Percentage Proximate Composition and PH Values of The Dung	
Parameters	Cow Dung
Moisture %	18.55 ± 0.28
Ash %	10.10 ± 0.02
Crude Fiber %	40.20 ± 0.12
Crude Protein %	6.80 ± 0.06
Crude Fat %	4.00 ± 0.42
Carbohydrate %	20.35 ± 0.34
pH	7.10 ± 0.01

Gas produced from cow dung is 55-65% methane, 30-35% carbon dioxide, with some hydrogen, nitrogen and other traces. Its heating value is around 600 B.T.U. per cubic foot. The cow dung slurry is composed of 1.8-2.4% nitrogen (N₂), 1.0-1.2% phosphorus (P₂O₅), 0.6-0.8% potassium (K₂O) and 50-75% organic humus.

4. CHICKEN LITTER:

Chicken litter, a by-product of poultry farming, is a potent feedstock for anaerobic digestion, offering a high methane yield due to its rich organic content and nitrogen levels. Approximately 1.5 cubic feet of biogas can be generated from one pound of chicken litter at around 28°C, making it an efficient energy source for household cooking and other

applications. Due to its high organic matter and nitrogen content, chicken litter is an excellent feedstock for biogas production through anaerobic digestion.

The methane potential of chicken litter is approximately 260–300 m³ per ton, making it a highly efficient raw material for biogas plants.

Percentage Proximate Composition and PH Values of The Chicken Litter	
Parameters	Chicken Litter
Moisture %	25.00 ± 0.30
Ash %	12.50 ± 0.05
Crude Fiber %	15.80 ± 0.10
Crude Protein %	30.00 ± 0.20
Crude Fat %	5.00 ± 0.35
Carbohydrate %	10.70 ± 0.28
pH	7.50 ± 0.02

Chicken litter biogas contains 60-70% methane (CH₄), 20-30% carbon dioxide (CO₂), and trace amounts of hydrogen (H₂), nitrogen (N₂), and ammonia (NH₃). Approximately 650-700 B.T.U. per cubic foot, making it a high-energy biofuel. The slurry left after digestion is a rich organic fertilizer containing 2.5–3.5% Nitrogen (N₂), 1.5–2.0% Phosphorus (P₂O₅), 0.8–1.2% Potassium (K₂O), 40-60% organic humus, improving soil fertility.

5. AVAILABILITY OF RAW MATERIAL:

As per the feedstock analysis and the data/information provided by the client, the plant will require cow dung around ~50 tons per day, Paddy Straw around ~38 tons per day and chicken litter around ~20 ton per day to produce the 5-ton Bio-CNG per day.

Since, May 2024, The Jwala biogas plant has fostered strong community support and partnerships with local farmers, working closely with the Reviving Green Revolution (RGR) Cell, an NGO under Tata Trusts that promotes sustainable farming.

REVIVING GREEN REVOLUTION (RGR) CELL AND ITS ROLE

Founded in 2008 under the Tata Trusts umbrella, RGR is committed to advancing sustainable farming techniques across Punjab. Headquartered at Punjab Agricultural University, RGR operates with a team of 500 professionals, including office and field staff. The organization has played a pivotal role in:

- **Encouraging in-site crop residue management** to mitigate environmental damage from stubble burning.
- **Promoting the cultivation and marketing of new summer crops** to diversify agricultural output.
- **Enhancing vegetable consumption** as part of broader efforts to improve nutritional security in Punjab.

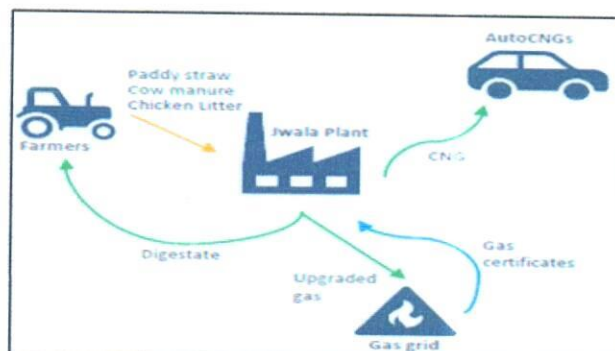
Key Initiatives and Impact

- **Community Engagement:** Jwala collaborates with farmer cooperatives to prevent stubble burning and repurpose paddy straw as feedstock.
- **Waste-to-Value Model:** Farmers sell manure to Jwala for biogas production and receive nutrient-rich digestate as organic fertilizer. Some may opt for an ownership stake in exchange for feedstock.
- **Sustainable Alternatives:** The plant provides an eco-friendly solution to Punjab's 17–18 million MT of annual paddy straw, 85–90% of which is currently burned, and leverages the state's 9.83 million MT of dairy waste for steady bioenergy production.

Three key objectives of the tie-up of Jwala Bioenergy with RGR Cell are:

- Build a symbiotic relationship with the farming community in the plant vicinity - defusing chances of protests, etc. against the plant.
- Ensure feedstock security by preventing stubble burning and sensitizing farmers about feedstock supply to the plant
- Ensure demand for the digestate (FOM) in the villages by promoting use of organic fertilizers

Punjab is also one of the most straw-dense regions on the planet as well, ensuring a long-term supply of dry matter for the digester. The straw itself is an unwanted by-product which requires removal for farming. The annual feedstock (excl. water) requirement of ~39k tonnes will be collected from within approximately 3km of the site, ensuring a local supply and providing demand for feedstock for around 10 villages.



Manure from farmers serves a dual function; as input to the biogas production process and as an output in the form of a digestate which is returned to the farmers as a valuable enhanced fertiliser. By integrating crop and dairy waste into energy production, Jwala's biogas plant serves as a sustainable solution to two major environmental challenges: stubble burning and agricultural waste management. The project not only mitigates pollution but also enhances rural livelihoods, soil health, and sustainable agricultural productivity.

Since May 2024, RGR Cell has conducted more than 20 camps in the villages. In collaboration with RGR Cell, Jwala Bioenergy has set up 8 Village Level Information (VLI) Centers. These centers are information hubs used by atleast 5-6 farmers every day per village - where they are given information about use of sustainable fertilizers, good cropping practices, etc. During the harvest season, these VLIs would serve as the hub for feedstock collection.

6. PRICING:

As farmers and agro-industries have now recognized the potential of paddy straw for revenue generation, its market value has significantly increased over the last two years. The price of paddy straw has risen from INR 500 per tonne to INR 1,500-1,800 per tonne, including transportation. Thus, the paddy straw, which is primarily generated from rice harvesting, is assumed to be made available to the project at INR 1,800 per tonne. The cattle dung is collected from various dairy farms/ nearby villages @ INR 400-500/MT and used as inoculants. As per the plan shared by the company, the by-product, organic manure/fertiliser to the farmers directly in exchange of the cow dung, which will ensure the lower procurement cost of the cow dung/chicken manure to the company.



PART H

INDUSTRY OVERVIEW

1. INTRODUCTION:

Bio-CNG is considered a renewable fuel and has also been proven to reduce the emission of greenhouse gasses when used as a transport fuel. Bio-CNG, derived from the filtration of biogas, is also referred to as Compressed Biogas (CBG) and bio-methane. It is derived from biogas after removing impurities like carbon dioxide and hydrogen sulphide. As per the details available on Gobardhan Portal (<https://gobardhan.co.in/>), approx. 118 CBG/Bio CNG plants are completed and functional in 187 districts and 201 CBG/ Bio CNG plants are under construction at present.

Bio-CNG plants get financial and other incentives from the Union government under the Sustainable Alternative towards Affordable Transport (SATAT) Scheme. The scheme, launched in 2018, supports the establishment and expansion of bio-CNG plants that use waste to produce biofuel. Under the scheme, the Union government plans to establish a total of 5,000 bio-CNG plants in India by the end of FY 2025.

2. POTENTIAL AND EXPANSION:

In India, around 70 percent of the sugarcane is produced by three major states – Uttar Pradesh, Maharashtra, and Karnataka. India produces, on an average, over 300 million metric tonnes of sugarcane per year. Around 3.5 percent of this, can be the amount of press mud produced. At this rate, India has the potential to produce around 10 million metric tonnes of press mud/filter cake per year that could be diverted for producing bio-CNG.

Indian sugar industry while crushing around 300 million tonnes of sugarcane and producing about 10 million tonnes of press mud annually can offer compressed bio-methane/bio-CNG to the extent of 0.4 million metric tonnes .

Feedstock	Pan India accessible amount (TPD)	Biogas potential per ton (kg)	Bio-CNG potential per ton (kg)	Pan India CBG potential (TPD)
Urban food waste, fruit and vegetable	50,000	75	40	2,000
Poultry litter	1,00,000	100	60	6,000
Press mud	1,00,000	150	80	8,000
Total				16,000

The Bio-CNG potential in India is estimated at 62 million metric tonnes (MMT) per annum, out of which the Sustainable Alternative towards Affordable Transportation (SATAT) scheme



aims to tap 15 MMT. India biogas market is expected to grow from \$1.47 billion in 2022 to \$2.25 Billion in 2029 at a CAGR of 6.3% during the forecasted period.

The sector is about to attract over USD 2 Billion investment in the next 5-7 years under its SATAT scheme, the govt. announced an ambitious plan of touching 15 million metric ton per annum, which is roughly 40,000 ton per Day.

Demand for alternative fuel vehicles in India is on the upswing and clearly seen in the increasing sales of CNG-powered vehicles. Given the favourable price arbitrage of CNG versus petrol and diesel, retail sales of CNG vehicles, across four sub-segments, crossed the 650,000-unit mark for the first time in a fiscal in FY2023. Cumulative sales of 660,153 units (see data table below) translate into strong double-digit YoY growth of 46% (FY2022: 451,552 units). (Ref.: <https://www.autocarpro.in/analysis-sales/cng-vehicle-sales-surge-by-46-to-over-650000-units-in-fy2023-114656>).

CNG passenger vehicles (PVs), with 318,752 units, account for 48% of the total retail sales in FY2023 and surged by 40.71% year on year (FY2022: 226,547 units) and took an 8.80% share of overall retail sales of 36,20,039 PVs in India.

3. CHALLENGES:

The GOI has formulated various policies and schemes to promote and mitigate challenges associated with the Bio-CNG sector. There are still some operational and technological challenges such as sensitivity towards biomass quality, biogas upgradation process among others which are impeding the uptake of Bio-CNG projects. Below table shows the challenges:

Feedstock Availability	Quality of Feedstock (including multiple feedstocks)	Technology Challenges	Bio-CNG and by-products' Market Challenges	Financing, and Implementation Challenges
<ul style="list-style-type: none"> No formal market for trading of feedstock Uncertainty of long-term regular supply of feedstock Demand supply mismatch - requirement of large storage facility Unorganized biomass value 	<ul style="list-style-type: none"> Variation in quality of feedstock throughout the year Some projects are designed to take multiple feedstock - optimal operation is a challenge and may also affect the quantity and quality of Bio-CNG Source segregation 	<ul style="list-style-type: none"> Technologies are sensitive to the quality of feedstock - slight change in feedstock quality will significantly impact the Bio-CNG production rate Capital 	<ul style="list-style-type: none"> Year-on-year variation in feedstock price - established feedstock pricing mechanism is required. Base price of Bio-CNG should be linked with feedstock cost variation mitigates the economic 	<ul style="list-style-type: none"> There are schemes by public sector banks to finance Bio-CNG project, but less private sector banks are financing Bio-CNG project that too at high cost of debt. Lack of access to infrastructure i.e. road network and CGD network near project sites. Large set of

chain – lack of sufficient collection, processing and transportation facility	is important – receiving non-segregated waste is an operational challenge	intensive technologies high upfront project cost	viability risks • Create market demand for by-products such as Bio manure etc.	approvals are required from PESO, pollution control board, MNRE – subsidy disbursement etc.
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4. GOVERNMENT INITIATIVES:

- Government has announced the phased mandatory blending of compressed biogas (CBG) in compressed natural gas (CNG) for transportation and piped natural gas (PNG) for domestic purposes in the latest interim budget for FY 2024-25.
- The government has increasingly focused on the production of compressed biogas in India. It is currently aiming to set up 5,000 CBG plants by FY25 under SATAT.
- Under Waste To Energy Programme, MNRE is providing the subsidy of INR 4.0 Cr per 4800 kg/day for Bio CNG generation from new biogas plant and INR 3.0 Cr per 4800 kg/day for Bio CNG generation from existing Biogas plant, while the maximum CFA of INR 10.0 Cr/project for both cases.
- GOBARDHAN: Ministry of Drinking Water and Sanitation, Financial assistance of INR 50 lakh per district is available for setting up model GOBARDHAN projects. SATAT Scheme OF MoPNG for encouraging OMCS's to issuance of LOI to the producers.
- Eight Biogas Development and Training Centres (BDTCs) have been established at India's premier Institutions to provide Technical Assistance, R & D, Testing and Validation of New Biogas Models / Designs, field inspections of biogas plants, and training and skill development.
- Government of Uttar Pradesh is providing the subsidy of INR 75 lac / Ton under the provision of UP Bio Energy Policy 2022 and Benefit up to INR 2.0 Cr from Agriculture Infrastructure Fund (AIF) – Circular dated 27th Oct. 2020.
- Market Development Assistance (MDA) for Promotion of Organic Fertilizers @ Rs. 1500 / Ton to CBG Plants.

5. CONCLUSION:

The business of bio CNG gases is in high demand because it is a clean and renewable source of energy. Additionally, it is more cost-effective than traditional sources of energy, and

it can be used to power a variety of vehicles. Bio CNG gas is also a versatile fuel that can be used in a variety of applications.

Though there are a few reasons for this increase in demand, the primary one seems to be that environmentalism is becoming more and more popular. As people become more aware of the damaging effects that traditional forms of energy have on the environment, they are searching for alternatives that are cleaner and renewable.

India biogas market is expected to grow from \$1.47 billion in 2022 to \$2.25 Billion in 2029 at a CAGR of 6.3% in forecast period, 2022-2029. Bio CNG gas is one such alternative, and its popularity is only increasing as time goes on. Bio CNG can be produced from a variety of organic materials, making it a sustainable choice for energy production. Additionally, bio CNG produces fewer emissions than traditional fossil fuels, making it a more environmentally-friendly option. Finally, bio CNG is becoming increasingly cost-competitive as technology advances and production methods improve.



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PART I

SWOT ANALYSIS

SWOT ANALYSIS

STRENGTHS

- **Strategic Location:** The project is situated in Dera Bassi, Punjab, several agricultural lands are situated near by the location of the proposed Bio CNG plant ensures the availability of agricultural residue (paddy straw), and at the same time strong urban demand centres with pipelines - Chandigarh as well as Patiala.
- **Growing Demand:** Due to renewable source of energy, demand for Bio-CNG is expected to grow at a CAGR of ~6 % in the upcoming years.
- **Commercial Agreement with Take-or-Pay:** The produced Bio CNG will be supplied to CGD (Indian Oil-Adani Gas) under CBG-CGD synchronisation Scheme through GAIL as per the LOI/tripartite agreement under SATAT scheme, which is an effortless avenue for the project to generate the revenue. **(Ref No. - WBPL-IOAGPL (GA-2.01)-GAIL dated 18.02.2025).**
- **Mode of Delivery:** Being one of the first direct pipeline injection plants in India, there is a high level of assurance for offtake from the plant, as opposed to the earlier SATAT plants which depended on cascade-based offtakes.
- **Government Support:** The project will be entitled to avail incentives of INR 4.15 Cr (INR 4.0 Cr per 4800 kg/day) for Bio CNG generation from new biogas plant, Under Waste to Energy Programme of Ministry of New and Renewable Energy.
- **Technology:** The proposed plant (Semi-Automatic) will be commissioned with "Sprinkling and not stirred technology" Mesophilic bio-methanation technology from Sauter, which is a proven technology empirically.
- **Backup Offtake Agreement:** The company has signed another LOI with IOCL dated 7th December 2023 **(Reference: Indian Oil/SATAT/01/2283/A)**

WEAKNESSES

- **CAPEX:** The proposed Bio CNG plant would be set up by a high initial investment, in which more than 70% capital would be required for plant & machinery.
- **Infrastructure Requirements:** The project's power load and water consumption are significant, and ensuring uninterrupted power supply

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	<p>and adequate water resources may pose challenges.</p> <ul style="list-style-type: none"> • Raw Material Market: There is no any formal market for raw material, leading to establish a feedstock pricing mechanism.
OPPORTUNITIES	<ul style="list-style-type: none"> • Increasing Alternate fuel's Demand: As the transportation industry is expanding, there will be an organic demand for Bio CNG/CBG as an alternate fuel due to mandatory blending of compressed biogas (CBG) in compressed natural gas (CNG) for transportation. • Expansion Potential: The Company is having the plan to expand its business in future for manufacturing Bio LNG for exports in foreign countries with huge demand potential. • Government Support: The project can benefit from government initiatives and policies aimed at promoting the Bio CNG production to achieve Net Zero target by 2070. • Carbon Credits: The Company has the opportunity to leverage the expanding carbon credit market, creating an additional revenue stream through its sustainable operations. By generating and monetizing carbon credits, the project can enhance its financial viability while contributing to global emissions reduction efforts.
THREATS	<ul style="list-style-type: none"> • Fluctuating Raw Material Prices: With the increasing demand of paddy straw, the prices are increasing. • Economic Factors: Profitability of the project may hamper due to any blockage of feed stock. However, the plant can also be run on cow dung and poultry litter also. • Dependency on Commercial Agreement: Any breach of the Offtake Purchase agreement with OMC, the company may require to search the new approach to sell its production in the market. However, considering the offtake into the pipeline and the pricing incentivization for the CGD company to take biogas deliveries, this probability seems low.



PART J

PROJECT COST AND MEANS OF FINANCE

As per data/information shared by the client, the proposed Bio CNG generating project is proposed to be commissioned by making an investment of INR 59.84 Crores as shown in the below table along with Means of finance:

Total Project Cost		
S. No.	Capital Cost Head	Amount (INR Crore)
1	Civil Works-ISGEC, India	8.65
2	EPC - ISGEC, India	31.27
3	EPC - Sauter, Germany	11.39
4	Pipeline Cost	1.80
5	Pre-Operative Expenses	3.33
6	IDC	2.14
7	Contingencies (2.50% of Item 1-5)	1.25
	TOTAL	59.84
Means of Finance		
S. No.	Particular	Amount (INR Crore)
1	Promoters' Margin	29.92
2	Loan from Banks	29.92
	TOTAL	59.84

Source: Data/Information provided by the company.

Notes:

- As per the shared sale/lease deed, a land parcel located at Village Jaulan Kalan, Tehsil Dera Bassi, District S.A.S. Nagar, Punjab-140501 admeasuring ~11.73 Kille and leased out in the name of M/s W2Jwala Bioenergy Private Limited for a period of 15 years with an option of renewal of 10 years at the end of lease on an annual lease rental of INR 18,36,918/annum with an annual escalation rate of 8% through an executed lease deed on 27th September 2024.
- As per the provisional contract with the EPC, the estimated cost of the Building & Civil works is ~INR 8.65 crores including applicable GST.
- The cost of Plant & Machinery has been considered as per the technical offer bid received from EPC Contractor (ISGEC) and technology provider (Sauter). The estimated cost for plant & machinery will be ~INR 42.66 crores including GST.

4. According to the details provided by the company, W2Jwala has proposed a total cost of INR 1.80 crore (inclusive of GST) for the construction of a 9-kilometer MDPE pipeline connecting the project site to the CGD (IOC Adani) entity's pipeline network for the distribution of Bio-CNG. This equates to a cost of INR 20 lakh per KM.
5. As per the information shared by the client/company, the estimated cost of other items described as Pre-operative Expenses would be ~INR 3.30 Cr. The details of Pre-Operative Expenses are shown in the table below:

S. No.	Particulars	Cost (In Cr.)
a	C.A.R. insurance	0.23
b	Freight DE to IN	0.15
c	Security	0.30
d	Construction Management	0.40
e	Salaries	0.60
f	RGR Cell	0.40
g	Permits	0.50
h	Temp transformer	0.25
i	Cabling	0.10
j	Fin. Brokerage	0.40
	Total	3.33

6. Contingency cost of INR 1.50 crores (~3% of TPC) has been considered based on general assumption and professional experience. Interest during Construction will be paid from April 2025 by the company @ 10%.
7. The Company's Dera Bassi Project has been registered in the Gobardhan Portal of Ministry of Jal Shakti. (Reg No. PB02001146TEMP dated 30 Jul 2024). Company is eligible for a subsidy of INR 4.15 crores Under Waste to Energy Programme of Ministry of New and Renewable Energy. As per the information/shared by the company/client, the company is eligible for a subsidy of INR 1.10 Crores for the 9 KM pipeline to be established from the project site to the CGD (IOC Adani) entity's pipeline network.
8. For the total project cost of INR 59.84 Crores, the project is proposed to be funded through a term loan of INR 29.92 crores and promoter's margin of INR 29.92 crores.
9. Thus, ~INR 10.02 Crore per ton excluding GST, IDC & contingency expenses considering the fact that the plant would be commissioned by the appointed EPC contractor from scratch to the successful trial run and the cost of setting up the plant is as per the contract agreement signed between the Company & EPC contractor.

However, as a TEV consultant we have verified the all the major costs which we found reasonable & in the permissible range with reference to the reasoning shared by the company which is mentioned above and as per the tertiary research done by us, data/information available in the public domain and information provided by the third-party consultants/vendors. (Ref: <https://pib.gov.in/PressReleasePage.aspx?PRID=1868887>).

Asia's largest Compressed Bio Gas (CBG) plant inaugurated in Sangrur on 18th Oct 2022 by Ministry of Petroleum & Natural Gas. The Plant was commissioned with an FDI investment of ~INR 220 crores, which is spread over an area of 20 acres. The installed capacity of the plant is 33 TPD. The capital expenditure of the plant is ~INR 6.67 Crore per ton. Some of the other references are shown in the below table:

Reference for Bio Gas Plant				
S. No.	Name of the Company	Plant Location	Remarks	
1.	Verbio AG	Lehragaga, Sangrur, Punjab	<ul style="list-style-type: none"> Production capacity – 33 TPD Biogas purification method – Amines (Chemical Based) Cost Rs. 230 Crore (Rs. 6.96 Crore per TPD) 	
2.	EverEnviro	Indore, Madhya Pradesh	<ul style="list-style-type: none"> Production capacity – 17 - 18 TPD Biogas purification method – PSA Cost Rs. 150 Crore (Rs. 8.82 – 8.33 Crore per TPD) 	
3.	Badaun CBG Plant	Badaun, Uttar Pradesh	<ul style="list-style-type: none"> Production capacity – 14 TPD Biogas purification method – NA Cost Rs. 133 Crore (Rs. 9.5 Crore per TPD) 	
4.	Gobardhan Bio CNG Plant	Madhya Pradesh	<ul style="list-style-type: none"> Production capacity – 15 - 20 TPD Biogas purification method – NA Cost Rs. 6.5 to 9 Crore per TPD 	



PART K

PROJECT IMPLEMENTATION SCHEDULE

The proposed Bio CNG generating unit is expected to achieve its C.O.D till 1st May 2026, as per the proposed implementation schedule shown in the table below:

S. No.	Major Milestones	Timeline	
		Start Date	End Date
1	Signing of EPC Contract	01-May-25	01-May-25
2	Signing of Sauter Contract	15-May-25	15-May-25
3	Detailed Design by EPC	01-May-25	15-Jun-25
4	Detailed Design by Sauter (Implementation Planning)	15-May-25	29-Jun-25
5	PO Placement of Digester tanks, Upgrading system and Pre-Treatment system	01-May-25	10-May-25
6	Provisional Fire NOC	01-May-25	30-May-25
7	Building Plan Approvals	01-May-25	30-Jun-25
8	Ground Water Extraction Approval	01-May-25	31-May-25
9	Approval for Temporary Electricity Consumption	01-May-25	31-May-25
10	Mobilization of EPC team for civil	15-Jun-25	30-Jun-25
11	On-site Civil work	01-Jul-25	30-Oct-25
12	On-site Electrical Work	20-Jul-25	30-Aug-25
13	On-site Piping Work	20-Jul-25	30-Sep-25
14	Digester tank Foundation	01-Jul-25	31-Jul-25
15	PO Placement of remaining items/ systems	01-Aug-25	10-Aug-25
16	On-site receipt of Digester Tanks (lead time)	10-May-25	08-Aug-25
17	On-site erection of Digester Tanks	09-Aug-25	30-Sep-25
18	On-site receipt of Upgrading System (lead time)	10-May-25	07-Oct-25
19	On-site receipt of Pre-Treatment system (lead time)	10-May-25	07-Sep-25
20	On-site receipt of other equipment (lead time)	10-Aug-25	09-Oct-25
21	Commence erection activity of other equipment	10-Oct-25	30-Jan-26
22	Installation of Fire Fighting equipment/system	10-Oct-25	29-Nov-25
23	Receipt of Sauter equipment on-site (lead time)	15-May-25	01-Dec-25
24	Erection activity of Sauter equipment	02-Dec-25	15-Jan-26
25	Integration & SCADA, Network connectivity	16-Jan-26	31-Jan-26
26	Consent to Operate	01-Nov-25	30-Jan-26
27	Other Mandatory Approvals (Fire NOC, Factory License,	01-Nov-25	30-Jan-26

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	permanent Electricity)		
28	Dry Commissioning of equipment	15-Feb-26	28-Feb-26
29	Inoculum, Feedstock availability & Troubleshooting	01-Mar-26	15-Mar-26
30	Full Commissioning & Performance Trials	15-Mar-26	25-Mar-26
31	Commercial Operational Date (COD)	01-May-26	01-May-26

Notes:

1. Schedule has been made as per feasibility to achieve different milestones.
2. Achievement of Milestone will depend on sanction of term loan as per proposed timeline.
3. For current status of statutory approvals, kindly refer the "Section L" of this report.
4. As per this timeline, the expected C.O.D will be 1st May 2026.



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PART L

STATUTORY APPROVALS | LICENCES | NOC

As shown in the below table along with current status, following major approvals are required. However, the list is not exhaustive and State/District Authorities may be approached for further clearances required (if any):

S. No.	Name Of License/ Registration Issuing Authority	Purpose	Licence No. With Date	Current Status
1.	Certificate of Incorporation	RoC registration	U35103PB2023FTC058577	Completed
	Ministry of Corporate Affairs, Government of India		19 th May 2023	
2.	Approval of Building / Site Plans	Grant of approval on building plans	-	Yet to Apply
	HUD & Dept. of Labour			
3.	Consent to Establish	NOC for CTE	PBIP/PPCB/2025/2523	Received
	Punjab Pollution Control Board		19 th February 2025	
4.	Application Form for Sewerage Connection	NOC for Sewage Connection	-	Yet to Apply
	Punjab Housing and Urban Development			
5.	NOC for fire-fighting	NOC under firefighting scheme	-	Yet to Apply
	Fire Service, Punjab			
6.	Central Ground Water Permission	NOC for Water Extraction	-	Yet to Apply
	CGWA Punjab			
7.	Power load sanction / Electric connection	For Power load sanction	-	Yet to Apply
	Punjab State Power Corporation Ltd			
8.	NoC for Boiler Installation	Boiler Installation / Erection Permission	-	Yet to Apply
	Director Boilers			
9.	Consent to Operate (CTO)	NOC for CTO		Yet to Apply

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	Punjab Pollution Control Board			
10.	Udyam Registration Certificate (MSME)		UDYAM-PB-20-0074502	Received
			8 th June 2024	
11.	GOBARDhan Registration Certificate		PB02001146TEMP	Received
			30 th July 2024	

Observation Note:

1. Company has received LOA for setting up of Compressed Biogas (CBG) Project of 12000m³ Raw Biogas per day (5 TPD CBG) from Punjab Energy Development Agency (A Punjab Govt. Undertaking) on 4th September 2023 (Ref: 8186-98).
2. Above is the only illustration of the major approvals sought or to be sought by the company. It should not be construed as the exhaustive list and in case any approval is missed to be mentioned then it is the sole responsibility of the company to keep the unit compliant with the necessary statutory approvals/ NOCs.



PART M

COMPANY'S FINANCIAL FEASIBILITY

1. PROJECTIONS OF THE FIRM:

The financial projections of the project are prepared from FY 2025-26 to FY 2040-41 based on the expected COD and loan tenor as per the best practice in industry to assess the financial feasibility of the project are elaborated below:

A. PROJECTED PROFIT & LOSS ACCOUNT:

(INR Crores, unless mentioned otherwise)

Particulars	Units	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
	Year	1	2	3	4	5	6	7
Technical Assumptions								
Sale Quantity - CBG	in TPA	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Sale Quantity - Digestate (FOM)	in TPA	37,450	37,450	37,450	37,450	37,450	37,450	37,450
Price per unit - CBG (3% increase)	Rs/ton	64,203	66,129	68,113	70,156	72,261	74,429	76,662
Price per unit - Digestate (FOM) (3% Increase)	Rs/ton	1,500.00	1,545.00	1,591.35	1,639.09	1,688.26	1,738.91	1,791.08
Capacity Utilisation		70%	96%	96%	96%	96%	96%	96%
Revenue								
Revenue - CBG		7.86	11.11	11.44	11.79	12.14	12.50	12.88
Revenue - Digestate (Solid)		3.93	5.55	5.72	5.89	6.07	6.25	6.44
Revenue - Compression charge		0.25	0.34	0.34	0.34	0.34	0.34	0.34
Revenue - Carbon Credits		0.30	0.30	0.30	0.30	0.30	0.30	0.30
Operational Revenues		12.34	17.30	17.80	18.32	18.85	19.39	19.95
Other Income		0.28	0.28	0.28	0.28	0.28	0.28	0.28
Total Income		12.62	17.58	18.08	18.60	19.13	19.67	20.23
Expenses								
Power & Fuel		0.99	1.40	1.44	1.48	1.53	1.57	1.62
Paddy Straw		1.68	2.37	2.44	2.51	2.59	2.67	2.75
Cow dung		0.50	0.71	0.73	0.75	0.78	0.80	0.82
Chicken manure		0.20	0.28	0.29	0.30	0.31	0.32	0.33
Water		0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lease Rental		0.20	0.21	0.23	0.25	0.27	0.29	0.31
O&M		1.08	1.11	1.15	1.18	1.22	1.25	1.29
Repair & Maintenance		0.22	0.31	0.32	0.33	0.34	0.35	0.36
SG&A		0.49	0.69	0.71	0.73	0.75	0.78	0.80
Other Expenses		0.36	0.47	0.48	0.50	0.51	0.53	0.54
Total Expenses		5.73	7.57	7.80	8.05	8.30	8.56	8.83
EBITDA		6.89	10.01	10.28	10.55	10.82	11.11	11.40
Depreciation		2.21	2.21	2.21	2.21	2.21	2.21	2.21
EBIT		4.68	7.80	8.06	8.33	8.61	8.90	9.19
Interest		2.42	2.24	1.98	1.70	1.38	1.04	0.65
PBT		2.26	5.56	6.08	6.64	7.23	7.86	8.54
One-Time Income (Subsidy)		4.83						

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PBT		7.08	5.56	6.08	6.64	7.23	7.86	8.54
Taxes		0.63	1.55	1.69	1.85	2.01	2.19	2.38
PAT		6.46	4.02	4.39	4.79	5.22	5.67	6.17

(Continued)

(INR Crores, unless mentioned otherwise)

Particulars	Units	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041
	Year	8	9	10	11	12	13	14	15
Technical Assumptions									
Sale Quantity - CBG	in TPA	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Sale Quantity - Digestate (Solid)	in TPA	37,450	37,450	37,450	37,450	37,450	37,450	37,450	37,450
Price per unit - CBG (5% increase)	Rs/ton	78,962	81,330	83,770	86,283	88,872	91,538	94,284	97,113
Price per unit - Digestate (Solid)	Rs/ton	1,844.81	1,900.16	1,957.16	2,015.87	2,076.35	2,138.64	2,202.80	2,268.88
Capacity Utilisation		96%	96%	96%	96%	96%	96%	96%	96%
Revenue									
Revenue - CBG		13.27	13.66	14.07	14.50	14.93	15.38	15.84	16.31
Revenue - Digestate (Solid)		6.63	6.83	7.04	7.25	7.46	7.69	7.92	8.16
Revenue - Compression charge		0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Revenue - Carbon Credits		0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Operational Revenues		20.53	21.13	21.75	22.38	23.03	23.70	24.40	25.11
Other Income		0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Total Income		20.81	21.41	22.03	22.66	23.31	23.98	24.68	25.39
Expenses									
Power & Fuel		1.67	1.72	1.77	1.82	1.88	1.93	1.99	2.05
Paddy Straw		2.83	2.91	3.00	3.09	3.18	3.28	3.38	3.48
Cow dung		0.85	0.87	0.90	0.93	0.95	0.98	1.01	1.04
Chicken manure		0.34	0.35	0.36	0.37	0.38	0.39	0.41	0.42
Water		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lease Rental		0.34	0.37	0.40	0.43	0.46	0.50	0.54	0.58
O&M		1.33	1.37	1.41	1.45	1.49	1.54	1.59	1.63
Repair & Maintenance		0.37	0.38	0.39	0.40	0.41	0.43	0.44	0.45
SG&A		0.82	0.85	0.87	0.90	0.92	0.95	0.98	1.00
Other Expenses		0.56	0.58	0.59	0.61	0.63	0.65	0.67	0.69
Total Expenses		9.11	9.40	9.70	10.01	10.33	10.66	11.01	11.36
EBITDA		11.70	12.01	12.32	12.65	12.98	13.32	13.67	14.02
Depreciation		2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
EBIT		9.49	9.80	10.11	10.44	10.77	11.11	11.46	11.81
Interest		0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PBT		9.26	9.80	10.11	10.44	10.77	11.11	11.46	11.81
One-Time Income (Subsidy)									
PBT		9.26	9.80	10.11	10.44	10.77	11.11	11.46	11.81
Taxes		2.58	2.73	2.81	2.90	3.00	3.09	3.19	3.29
PAT		6.69	7.07	7.30	7.53	7.77	8.02	8.27	8.53

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C. PROJECTED CASH FLOW STATEMENT:

(INR Crores)

YEAR	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
Particulars	Constr.	12 M	12 M	12 M	12 M	12 M	12 M	12 M
A. SOURCE OF FUND								
Net Profit	0.00	6.46	4.02	4.39	4.79	5.22	5.67	6.17
Increase in Equity / Share Capital/USL	33.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in TL	29.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in Current Liabilities	0.00	0.47	0.15	0.02	0.02	0.02	0.02	0.02
Depreciation	0.00	2.21	2.21	2.21	2.21	2.21	2.21	2.21
TOTAL	63.84	9.14	6.38	6.62	7.02	7.45	7.91	8.40
B. APPLICATION OF FUNDS								
Capital Expenses	59.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bank Deposit	4.00							
Decrease in Term Loan		6.35	2.40	2.70	3.00	3.30	3.60	4.20
Trade Receivable		0.51	0.20	0.02	0.02	0.02	0.02	0.02
Inventory		0.89	0.37	0.04	0.04	0.04	0.04	0.04
TOTAL	63.84	7.74	2.97	2.76	3.06	3.36	3.66	4.27
Opening Balance	0.00	0.00	1.40	4.81	8.67	12.63	16.72	20.97
Net Surplus/ Deficit	0.00	1.40	3.41	3.86	3.96	4.09	4.24	4.14
Closing Balance	0.00	1.40	4.81	8.67	12.63	16.72	20.97	25.10

(Continued)

(INR Crores)

YEAR	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041
Particulars	12 M	12 M	12 M	12 M	12 M	12 M	12 M	12 M
A. SOURCE OF FUND								
Net Profit	6.69	7.07	7.30	7.53	7.77	8.02	8.27	8.53
Increase in Equity / Share Capital/USL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in TL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in Current Liabilities	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
Depreciation	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
TOTAL	8.92	9.31	9.54	9.77	10.01	10.26	10.51	10.77
B. APPLICATION OF FUNDS								
Capital Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bank Deposit								
Decrease in Term Loan	4.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trade Receivable	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Inventory	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
TOTAL	4.44	0.07	0.07	0.07	0.08	0.08	0.08	0.08
Opening Balance	25.10	29.59	38.83	48.29	57.99	67.92	78.10	88.53
Net Surplus/ Deficit	4.48	9.24	9.46	9.70	9.93	10.18	10.43	10.68
Closing Balance	29.59	38.83	48.29	57.99	67.92	78.10	88.53	99.21

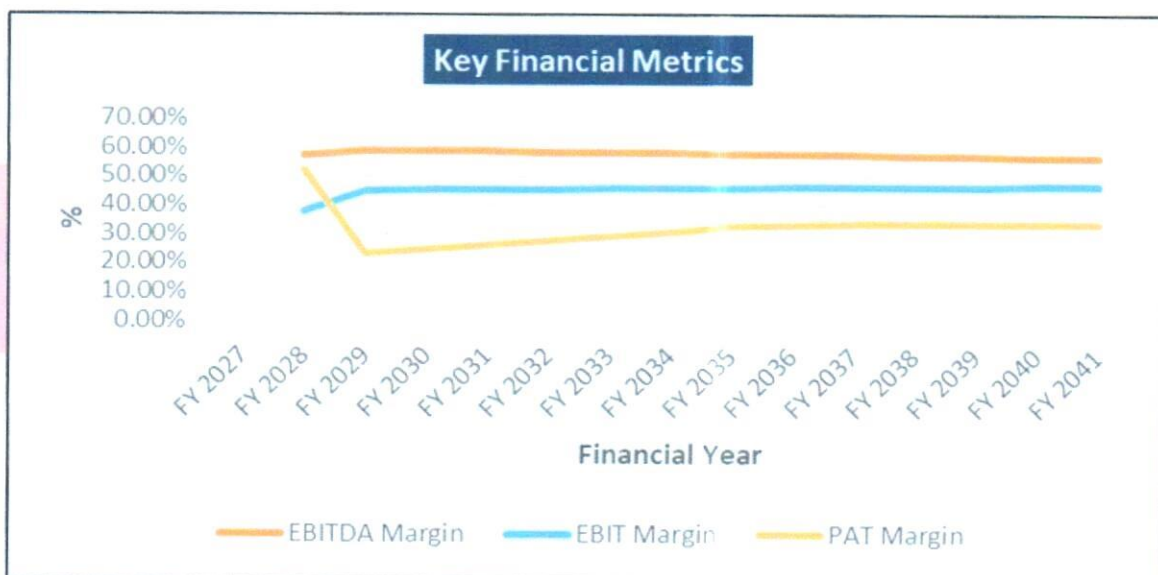
D. KEY FINANCIAL RATIO:

YEAR	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034
EBITDA Margin %	57.20%	58.90%	58.72%	58.54%	58.37%	58.19%	58.01%	57.83%
EBIT Margin %	37.89%	45.09%	45.30%	45.51%	45.70%	45.88%	46.05%	46.21%
PAT Margin %	52.30%	23.21%	24.66%	26.16%	27.69%	29.26%	30.90%	32.56%

(Continue)

YEAR	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Average
EBITDA Margin %	57.65%	57.47%	57.29%	57.10%	56.91%	56.72%	56.53%	57.70%
EBIT Margin %	46.36%	46.50%	46.63%	46.75%	46.86%	46.96%	47.05%	45.65%
PAT Margin %	33.46%	33.57%	33.66%	33.74%	33.82%	33.89%	33.96%	32.19%

E. GRAPHICAL REPRESENTATION OF KEY RATIOS:



F. ESTIMATED KEY FINANCIAL METRICS:

DEBT SERVICE COVERAGE RATIO (DSCR)

Particulars	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	Total
PAT	6.46	4.02	4.39	4.79	5.22	5.67	6.17	6.69	43.40
Depreciation	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	17.70
Interest Cost	2.42	2.24	1.98	1.70	1.38	1.04	0.65	0.23	11.62
Amount Available for Repayment	11.08	8.47	8.58	8.70	8.81	8.92	9.03	9.12	72.72
Interest Cost	2.42	2.24	1.98	1.70	1.38	1.04	0.65	0.23	11.62
Repayment of Loan	6.35	2.40	2.70	3.00	3.30	3.60	4.20	4.37	29.92
Repayment Obligation	8.77	4.64	4.68	4.70	4.68	4.64	4.85	4.60	41.54
DSCR	1.26	1.83	1.83	1.85	1.88	1.92	1.86	1.99	1.75
Average D.S.C.R.	1.75								
Max. D.S.C.R.	1.99								

G. SENSITIVITY ANALYSIS OF D.S.C.R:

The proposed project is found comparatively more sensitive with respect to the cost of raw material, than the revenue and any surge in the interest rate. Sensitivity analysis of the project with respect to 5% decrease in the revenue, 5% increase in the cost of raw material, 2% increment in the proposed interest rate and 5% decrease in generation has been shown in the below table:

Sensitivity Analysis of D.S.CR			
S. No.	Particular	Average D.S.C.R	Max. D.S.C.R
1.	If the projected revenue decreased by 5%	1.63	1.83
2.	If the projected Cost of raw material increased by 5%	1.65	1.80
3.	If interest rate is increased by 2%	1.67	1.97
4.	If the generation is decreased by 5%	1.67	1.88

H. NPV,IRR AND PAYBACK PERIOD OF THE PROJECT:

(INR Crores)

Particulars	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
NOPAT	0.00	4.97	7.23	7.42	7.61	7.81	8.02	8.23
Depreciation	0.00	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Interest Cost	0.00	2.42	2.24	1.98	1.70	1.38	1.04	0.65
Cash Inflow	0.00	9.60	11.68	11.61	11.52	11.41	11.27	11.09
Interest on Term Loan	0.00	2.42	2.24	1.98	1.70	1.38	1.04	0.65
Prin. Repayment of TL	0.00	6.35	2.40	2.70	3.00	3.30	3.60	4.20
Loan Liabilities	0.00	8.77	4.64	4.68	4.70	4.68	4.64	4.85
Weighted Average cost of capital	10.32%							
Terminal Growth Rate	1.50%							
Equity/ USL/ Promoters Contribution	29.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Project Cost	59.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Terminal Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equity IRR cash flow	-29.92	0.83	7.04	6.93	6.83	6.73	6.63	6.24
Project IRR cash flow	-59.84	9.60	11.68	11.61	11.52	11.41	11.27	11.09

(Continue)

Particulars	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041
NOPAT	8.45	8.67	8.90	9.13	9.37	9.61	9.87	10.12
Depreciation	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Interest Cost	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cash Inflow	10.88	10.88	11.11	11.34	11.58	11.83	12.08	12.34
Interest on Term Loan	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prin. Repayment of TL	4.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loan Liabilities	4.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weighted Average cost	10.32%							

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of capital								
Terminal Growth Rate	1.50%							
Equity/ USL/ Promoters Contribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Project Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Terminal Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	141.97
Equity IRR cash flow	6.29	10.88	11.11	11.34	11.58	11.83	12.08	154.31
Project IRR cash flow	10.88	10.88	11.11	11.34	11.58	11.83	12.08	154.31
Equity IRR (%)	24.37%							
Project IRR (%)	20.39%							
NPV (INR Cr)	56.38							

Calculation of Discount Rate			
Particulars	Weight	Cost	Weighted Cost
Equity	50.00%	11.42%	5.71%
Debt	50.00%	10.00%	3.61%
Total			9.32%
Company Risk Premium			1.00%
Appropriate Discount Rate			10.32%

Payback Period of the Project		
Financial Year	Cash Accrual	Accumulated Cash Accrual
FY 2026	-	-
FY 2027	8.67	8.67
FY 2028	6.23	14.90
FY 2029	6.60	21.50
FY 2030	7.00	28.50
FY 2031	7.43	35.93
FY 2032	7.89	43.82
FY 2033	8.38	52.20
FY 2034	8.90	61.10
FY 2035	9.28	70.38
FY 2036	9.51	79.89
FY 2037	9.74	89.64
FY 2038	9.98	99.62
FY 2039	10.23	109.85
FY 2040	10.48	120.33
FY 2041	10.74	131.07
TPC	INR 59.84 Crores	
Payback Period	7.86 Years	

Thus, the project will be having a payback period of **7.86 years** and NPV, Equity IRR & Project IRR of the project as on COD will **INR 56.38 Crores, 24.37% & 20.39%** respectively, which indicates worthiness of the project.

I. OTHER FINANCIAL RATIOS:



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Particulars	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
Return On Sale (%)	-	52.30%	23.21%	24.66%	26.16%	27.69%	29.26%	30.90%
Return On Capital (%)	-	7.31%	11.90%	11.99%	12.07%	12.14%	12.18%	12.25%
Return On Investment	-	21.58%	13.42%	14.67%	16.01%	17.44%	18.96%	20.61%
Return On Net Worth	-	15.99%	9.05%	9.00%	8.94%	8.88%	8.80%	8.73%
DSCR	-	1.26	1.83	1.83	1.85	1.88	1.92	1.86
Fixed Assets Coverage	-	2.44	2.62	2.88	3.30	4.01	5.43	10.15
Interest Coverage Ratio	-	4.59	3.78	4.33	5.13	6.38	8.60	13.95
Current Ratio	-	8.49	10.92	16.79	22.21	27.43	32.49	37.43
Tol / TNW	100%	59.54%	49.09%	39.18%	30.11%	21.86%	14.38%	7.21%
Debt - Equity Ratio	100%	58.38%	47.69%	37.86%	28.88%	20.70%	13.29%	6.19%

(Continue)

Particulars	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041
Return On Sale (%)	32.56%	33.46%	33.57%	33.66%	33.74%	33.82%	33.89%	33.96%
Return On Capital (%)	12.27%	11.61%	11.03%	10.52%	10.06%	9.66%	9.29%	8.96%
Return On Investment	22.35%	23.63%	24.40%	25.18%	25.98%	26.80%	27.64%	28.50%
Return On Net Worth	8.65%	8.38%	7.96%	7.59%	7.26%	6.97%	6.71%	6.47%
DSCR	1.99	-	-	-	-	-	-	-
Fixed Assets Coverage	-	-	-	-	-	-	-	-
Interest Coverage Ratio	40.34	-	-	-	-	-	-	-
Current Ratio	41.89	46.49	56.73	66.56	76.00	85.06	93.74	102.05
Tol / TNW	0.97%	0.92%	0.87%	0.83%	0.79%	0.76%	0.73%	0.71%
Debt - Equity Ratio	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

J. BREAK-EVEN ANALYSIS:

(INR Crores)

Particulars	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
TOTAL SALES	-	12.34	17.30	17.80	18.32	18.85	19.39	19.95
LESS: VARIABLE COST	-	4.09	5.77	5.94	6.12	6.30	6.49	6.69
CONTRIBUTION	-	8.25	11.53	11.86	12.19	12.54	12.90	13.27
TOTAL FIXED COST	-	6.27	6.24	6.05	5.84	5.59	5.32	5.01
Profit / PBT	-	1.98	5.28	5.80	6.36	6.95	7.58	8.26
PV RATIO	-	67%	67%	67%	67%	67%	67%	66%
BEP Sales	-	2.46	2.69	2.79	2.89	3.00	3.11	3.23
BEP%	-	20%	16%	16%	16%	16%	16%	16%

(Continue)

Particulars	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041
TOTAL SALES	20.53	21.13	21.75	22.38	23.03	23.70	24.40	25.11
LESS: VARIABLE COST	6.89	7.09	7.30	7.52	7.75	7.98	8.21	8.46
CONTRIBUTION	13.65	14.04	14.44	14.86	15.29	15.73	16.18	16.65
TOTAL FIXED COST	4.67	4.52	4.61	4.70	4.80	4.90	5.01	5.12

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Profit / PBT	8.98	9.52	9.83	10.16	10.49	10.83	11.18	11.53
PV RATIO	66%	66%	66%	66%	66%	66%	66%	66%
BEP Sales	3.35	3.48	3.61	3.75	3.90	4.05	4.21	4.38
BEP%	16%	16%	17%	17%	17%	17%	17%	17%

K. TERM LOAN INPUTS:

Term Loan Repayment Inputs	
Total loan amount	INR 29,91,91,403.25
Rate of Interest	10.00%
1st Disbursement	April-25
IDC Start & End Month	April-25 to April-26
IDC Period (construction period)	13 Months
Commencement /Operation Start	May-26
Moratorium Start & End Month (only interest to pay)	April 2025 to April 2026
Repayment Start	May 2026
Repayment End	March 2034
Repayment Period	95 Months

(INR Crores)									
YEAR/ASSET HEAD	2026	2027	2028	2029	2030	2031	2032	2033	2034
Opening Balance	-	29.92	23.57	21.17	18.47	15.47	12.17	8.57	4.37
Disbursement	29.92	-	-	-	-	-	-	-	-
Repayment	-	6.35	2.40	2.70	3.00	3.30	3.60	4.20	4.37
Closing balance	29.92	23.57	21.17	18.47	15.47	12.17	8.57	4.37	-
Interest	-	2.42	2.24	1.98	1.70	1.38	1.04	0.65	0.23
IDC	1.89	0.25	-	-	-	-	-	-	-
Term Loan Interest	1.89	2.67	2.24	1.98	1.70	1.38	1.04	0.65	0.23

L. DEPRECIATION SCHEDULE (STRAIGHT LINE METHOD):

(INR Crores)							
YEAR/ASSET HEAD	2027	2028	2029	2030	2031	2032	2033
Building	9.74	9.74	9.74	9.74	9.74	9.74	9.74
SLM Depreciation - Build	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Plant & Machinery	50.09	50.09	50.09	50.09	50.09	50.09	50.09
SLM Depreciation - P&M	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Total SLM Depreciation	2.21	2.21	2.21	2.21	2.21	2.21	2.21

(Continue)								
YEAR/ASSET HEAD	2034	2035	2036	2037	2038	2039	2040	2041

TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

Building	9.74	9.74	9.74	9.74	9.74	9.74	9.74	9.74
SLM Depreciation - Build	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Plant & Machinery	50.09	50.09	50.09	50.09	50.09	50.09	50.09	50.09
SLM Depreciation - P&M	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Total SLM Depreciation	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21

2. KEY ASSUMPTIONS & BASIS:

S. No.	Item	Assumptions and Basis												
1.	General	<p>a. The projections of the firm are done for the period from FY 2026 to FY 2041, 16 years, to cover the term loan period as per the industry best practices. It is assumed that the plant will be achieving COD on 1st May 2026.</p> <p>b. We have considered both Revenue & cost based model (top to bottom approach) while making the future financial projections.</p> <p>c. Revenue modelling has been done based on required production as per the tripartite agreement between W2Jwala, GAIL and Indian Oil-Adani Gas. Expense modelling has been done based on the capacity utilization during the respective year except for the raw material which is considered based on raw material ratio and its price in the market.</p>												
2.	Revenue Build up	<p>a. The plant is assumed to be operational for 350 days for 24 hours annually.</p> <p>b. Company will be generating the revenue by selling 5TPD Bio-CNG to GAIL as per tripartite agreement on 18th February 2025 and by-products (Fermented Organic Manure). Below table shows the Revenue of the company @70% capacity utilization in the first operational year:</p> <table><tr><th colspan="4">Revenue @70% capacity</th></tr><tr><th>Products</th><th>Unit Price</th><th>Annual Quantity (TPA)</th><th>Amount (INR Cr.)</th></tr><tr><td>Sale of Bio-CNG</td><td>INR 64.20/Kg</td><td>1,750</td><td>7.86</td></tr></table>	Revenue @70% capacity				Products	Unit Price	Annual Quantity (TPA)	Amount (INR Cr.)	Sale of Bio-CNG	INR 64.20/Kg	1,750	7.86
Revenue @70% capacity														
Products	Unit Price	Annual Quantity (TPA)	Amount (INR Cr.)											
Sale of Bio-CNG	INR 64.20/Kg	1,750	7.86											

TECHNO-ECONOMIC VIABILITY REPORT M/S W2JWALA BIOENERGY PRIVATE LIMITED

		<table><tr><td>Revenue – Compression Charges</td><td>INR 2.00/Kg</td><td>1,750</td><td>0.25</td></tr><tr><td>Revenue-FOM</td><td>INR 1.50/Kg</td><td>37,450</td><td>3.93</td></tr><tr><td>Revenue-Carbon Credits</td><td>-</td><td>-</td><td>1.00</td></tr><tr><td colspan="3">Total Revenue (INR)</td><td>12.34</td></tr></table>	Revenue – Compression Charges	INR 2.00/Kg	1,750	0.25	Revenue-FOM	INR 1.50/Kg	37,450	3.93	Revenue-Carbon Credits	-	-	1.00	Total Revenue (INR)			12.34
Revenue – Compression Charges	INR 2.00/Kg	1,750	0.25															
Revenue-FOM	INR 1.50/Kg	37,450	3.93															
Revenue-Carbon Credits	-	-	1.00															
Total Revenue (INR)			12.34															
		<p>c. Thus, the company is expected to generate INR 12.34 Crores (@ 70% Capacity Utilization) in the initial year. Further it is expected to increase up to INR 25.11 Crores till FY 2040-41 (@ 96% Capacity Utilization).</p> <p>d. Based on the forecasting, the company is achieving an average revenue growth rate of 3% Y-o-Y basis from FY 2027-28 due to a 3% escalation assumed in the selling price during the forecasted period.</p> <p>e. As per the information provided by the client, the revenue from carbon credits is assumed constant @ INR 0.30 Crore on a conservative basis.</p> <p>f. Apart from this, the company is supposed to deposit INR 4.00 Crores with the bank as security. We have assumed the company would earn the interest income on this deposit @ 7% annually.</p> <p>g. Company is eligible for a subsidy of INR 4.15 crores under Waste to Energy Programme of Ministry of New and Renewable Energy and INR 67.50 Lakhs (INR 0.075 Cr per KM) under “Direct Pipeline Infrastructure” scheme of Ministry of Petroleum and Natural Gas.</p>																
3.	Pricing (Average Price Per Unit)	<p>a. Proposed selling price per unit of CBG and by products are shown in the below table:</p> <table><tr><th colspan="2">Selling price per unit</th></tr><tr><th>Products</th><th>Unit prices</th></tr><tr><td>Selling price of Bio-CNG</td><td>INR 64.203 per kg</td></tr><tr><td>Compression Charges</td><td>INR 2.00 per kg</td></tr><tr><td>Selling price of FOM</td><td>INR 1.50 per kg</td></tr></table> <p>b. The Bio-CNG produced has to be sold to GAIL will purchase the CBG from W2Jwala (Seller/Producer) and onward sale of Biogas/CBG by</p>	Selling price per unit		Products	Unit prices	Selling price of Bio-CNG	INR 64.203 per kg	Compression Charges	INR 2.00 per kg	Selling price of FOM	INR 1.50 per kg						
Selling price per unit																		
Products	Unit prices																	
Selling price of Bio-CNG	INR 64.203 per kg																	
Compression Charges	INR 2.00 per kg																	
Selling price of FOM	INR 1.50 per kg																	

		<p>GAIL to the CGD Entity after pooling with APM/NAPM domestic gas, meeting the required specifications, for use in Geographical Area of Chandigarh [GA-2.01] in the State of Chandigarh, Haryana, Punjab & Himachal Pradesh, for which the company have already secured a purchase agreement/LOI, the procurement price of Bio-CNG from GAIL as per the SATAT Scheme is around @INR 64.203 per kg without GST excluding compression charges @ INR 2/Kg.</p> <p>c. The by-product of digestate is called fermented organic manure/fertilizer, which is being sold in the current market at INR 1.50 per kg.</p> <p>d. The selling price of Bio-CNG is considered on conservative side as INR 64.203/kg (excluding compression charges @ INR 2/Kg). The selling rate of organic solid fertilizers is assumed as INR 1.50 per kg on conservative side.</p> <p>e. An escalation factor of 3% has been considered in the prices of the sellable products during the forecasted periods considering the micro and macro-economic factors.</p>
4.	Capacity Utilization	<p>a. The proposed CBG generating plant will be commissioned which will be operating at 96% (12,000 M3/Day) of the designed capacity to generate 5,000 Kg Bio-CNG per day as per tripartite agreement under CBG-CGD Synchronisation Scheme under SATAT initiative.</p> <p>b. We have assumed 96% capacity utilisation of the plant from the throughout the projected period since 5,000 kg Bio CNG has to be supplied by the company.</p>
5.	Capital Expenditure	<p>a. The estimated cost of the Building & Civil works is ~INR 8.65 Crores including GST.</p> <p>b. The cost of Plant & Machinery has been considered as per the technical offer bid received from EPC Contractor (ISGEC) and technology provider (Sauter). The estimated cost for plant &</p>

		<p>machinery will be ~INR 42.66 crores including GST.</p> <p>c. According to the details provided by the company, W2Jwala has proposed a total cost of INR 1.80 crore (inclusive of GST) for the construction of a 9-kilometer MDPE pipeline connecting the project site to the CGD (IOC Adani) entity's pipeline network for the distribution of Bio-CNG. This equates to a cost of INR 20 lakh per KM.</p> <p>d. Pre-Operative Expenses has been taken as per the data/information shared by the company/client, based on the time period of construction and estimate of company's resources involvement during this time in supervision & monitoring of the construction as INR 3.33 crores.</p> <p>e. Contingency cost of INR 1.25 crores (~2.50% of TPC) has been considered based on general assumption. Interest during Construction will be paid from April 2025 by the company @ 10.00%.</p> <p>f. Hence, INR 10.02 Crore per ton excluding GST, IDC & contingency expenses will be the capex for this proposed plant which is slightly on the higher side in comparison with the industrial and sectoral benchmarks. But, the adoption of advanced german technology, pre-treatment system for paddy straw, Additional for laying the pipeline to ensure delivery of Bio-CNG, Oversized Anaerobic Digester Tanks for Optimal Gas Yield, Advance Gas Processing and Grid Injection System makes the higher capital expenditure justifiable.</p>												
6.	Expenses	<p>a. The paddy straw will be costing @ INR 1800 per ton including transportation. Cattle dung and Chicken Manure is collected from various dairy farms/ nearby villages @ INR 410 per MT including transportation and used as inoculants. The cost of the raw material @ 100% capacity has been shown in the below table:</p> <table><tr><th colspan="4">Raw material Cost @ 100% capacity</th></tr><tr><th>Raw Material</th><th>INR/Unit</th><th>Annual Quantity</th><th>Amount INR Crore</th></tr><tr><td>Cattle Dung including Transportation</td><td>410</td><td>13,315</td><td>2.40</td></tr></table>	Raw material Cost @ 100% capacity				Raw Material	INR/Unit	Annual Quantity	Amount INR Crore	Cattle Dung including Transportation	410	13,315	2.40
Raw material Cost @ 100% capacity														
Raw Material	INR/Unit	Annual Quantity	Amount INR Crore											
Cattle Dung including Transportation	410	13,315	2.40											

Paddy Straw including Transportation	1800	17,520	0.72
Chicken Manure including Transportation	410	7,008	0.29
Water	10	7,300	0.01
Total	INR 3.41 Crore		

- b. As per our tertiary research and data available in the public domain, we found the unit rate are in the permissible range. Escalation of 3% is considered during forecasted period.
- c. As per information provided by the client, estimated annual consumption of the power will be 17,66,940 Kwh. As per information available on the public domain, the applicable per unit charges will INR 8 per Kwh. Thus, the annual electricity expenses would be INR 1,41,35,520 (@100% Capacity). An escalation rate of 3% is assumed on it.
- d. As per information shared by the client/company, Jwala Bioenergy Private Limited is planning to outsource the Operations & Maintenance (O&M) of its biogas plant to a third-party service provider, which is yet to be finalized. As part of this arrangement, the selected service provider will be responsible for managing all aspects of plant operations, maintenance, and associated activities. The cost of O&M is considered as INR 9 Lakhs per month. A 3% escalation rate has been considered during the forecasted period.
- e. Land has been procured for 16 years (with an option of renewal of 10 years at the end of 16 years) on an annual lease rental of INR 19,83,871/annum through an executed lease deed on 27th September 2024 with an annual escalation rate of 8%.
- f. Transportation Cost for the FOM has been considered as INR 4.00 per ton per KM. The distance for transport is assumed to be 25 KM on average with an average load of 100 TPD of fertilizers which makes the cost to be INR 10,000 per day and an annual escalation rate of 3% has been considered.
- g. Cost for Spare Parts, OEM Service and SG&A Expenses are considered

		<p>as 1.2%, 0.6% and 4% of Operational Revenue respectively.</p> <p>h. The cost of Insurance is assumed as INR 10,00,000 per year and an annual escalation rate of 3% has been considered. Insurance covers CBG Plant and Facilities.</p> <p>i. The cost of licensing and other approvals is assumed as INR 1,82,500 per year and an annual escalation rate of 3% has been considered. Insurance covers CBG Plant and Facilities.</p>
7.	Partial Loan	<p>a. The project is proposed to be funded through a term loan of INR 29.92 crore and promoter's margin of INR 29.92 crores.</p> <p>b. The tenure of the loan will be 9 years from April 2025 to March 2034. The repayment period of the loan will be 95 months post C.O.D. i.e., 1st May 2026, the next 13 months will be considered as moratorium period.</p> <p>c. As per discussion with client, Interest rate has been considered as 10.00%.</p>

Key Findings:

1. Average DSCR, EBIDTA margin, EBIT margin is 1.75, 57.70%, and 45.65% respectively during the estimated period.
2. The company is having a positive NPV and IRR, of INR 56.38 crores and 20.39% respectively at the base cases while it may vary with changes in the assumptions & micro and macro-economic trends considered as on date.
3. The proposed project is having a payback period of 7.86 years.
4. Based on the above key financial ratios of the proposed Project during the forecasted period shows that the project appears financially viable if the promoters of the project are able to maintain assumed capacity utilization, revenue and can contain cost as assumed above in the calculation.



PART N

CONCLUSION

Based on the technological, economical and market analysis done above, various assumptions of sectoral trends taken, product pricing to be adopted by the company, the Project appears to be Techno-commercially viable subject to the risks, threats, weaknesses, limitations of the product as detailed previously.

As per financial projections for the estimated period, **Average DSCR, EBITDA Margin and EBIT Margin** of the project are **1.75, 57.70%, and 45.65%** respectively, where higher DSCR is the indicator of the project capability to pay out its outstanding debt and EBITDA margin shows the capability of the project to generate the operating profits over the forecasted period. Also, the project is having the payback period of **7.86 Years** in the line with sectoral trends.

The proposed Bio-CNG generating facility is having a positive **NPV and IRR** as **INR 56.38 crores** and **20.39%** respectively at a 96% capacity utilization as the industry is expectedly growing at a CAGR of 6.34% during the forecasted period. While it is not avoidable that the future projections may change in the upcoming years due to various factors impacting the operation, managerial, financial efficiency and economies of scale of the project.




While it would be depending on the management's capability in future that how efficiently company adopts marketing and advertisement strategy, supply chain and carry out inventory & resource management to achieve higher profitability. After considering the foreseen demand of the Bio CNG and its by-products domestically and globally, various initiatives taken by the government, financial analysis of the project based on the assumptions taken over the projected period, it appears reasonable to comment that the proposed project is "**Technically and Economically**" Viable subject to current assumptions considered and occurring the same in the upcoming years same as the forecasted period which is dependent on the sincerity and efforts of the management and various micro and macroeconomic & industry situation.

We have tried our level best to analyse the Project techno-economic feasibility of the Project based on the Industry research, Project information and various futuristic assumption taken within the limitations and challenges came in front of us. However achieving the financial milestones depends on the ability, sincerity and efforts of the company, promoters and its key management to maintain the projected revenue level Y-o-Y basis keeping the fact in mind that the project is found sensitive with respect to the down side fluctuation in the revenue.

TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

Declaration	<p>i. The undersigned does not have any direct/indirect interest in the above property/project/Company.</p> <p>ii. The information furnished herein is true and correct to the best of our knowledge, logical and scientific assumptions.</p> <p>iii. This TEV Report is carried out by our Financial Analyst team on the request from M/s W2Jwala Bioenergy Private Limited.</p> <p>iv. Meeting of Financial projections will be subject to the market & economy stability factors, judicious business operations and proper & timely implementation of the project and putting proper plan for achieving high productivity, efficiency and achieving cost saving benefits to increase profitability.</p> <p>v. We have submitted TEV report to State Bank of India, SME Branch, Vatika First India Place, Mehrauli-Gurgaon Road, Sector-28, Gurugram, Haryana-122002 as requested by the client/company.</p>
Number of Pages in the Report	93
Enclosed Documents	Disclaimer & Remarks 84-87
Place	Noida
Date	24 th February 2025

FOR ON BEHALF OF		
M/S. R.K. ASSOCIATES VALUER & TECHNO ENGINEERING CONSULTANTS PVT. LTD.		
SURVEYED BY	PREPARED BY	REVIEWED BY
Mr. Atul Gola	Mr. Gaurav Kumar	Mr. Rachit Gupta
		



PART O

DISCLAIMER | REMARKS

1. No employee or member of R.K Associates has any direct/ indirect interest in the Project.
2. This report is prepared based on the copies of the documents/ information which the Bank/ Company has provided to us out of the standard checklist of documents sought from them and further based on our assumptions and limiting conditions. The client/owner and its management/representatives warranted to us that the information they supplied was complete, accurate and true and correct to the best of their knowledge. All such information provided to us has been relied upon in good faith and we have assumed that it is true and correct in all respect. I/We shall not be liable for any loss, damages, cost or expenses arising from fraudulent acts, misrepresentations, or wilful default on part of the owner, company, its directors, employee, representative or agents. Verification or cross checking of the documents provided to us from the originals or from any Govt. departments/ Record of Registrar has not been done at our end since this is beyond the scope of our work. If at any time in future, it is found or came to our knowledge that misrepresentation of facts or incomplete or distorted information has been provided to us then this report shall automatically become null & void.
3. Legal aspects for e.g. investigation of title, ownership rights, lien, charge, mortgage, lease, sanctioned maps, verification of documents, etc. have not been done at our end and same has to be taken care by legal expert/ Advocate. It is assumed that the concerned Lender/ Financial Institution has satisfied them with the authenticity of the documents, information given to us and for which the legal verification has been already taken and cleared by the competent Advocate before requesting for this report. I/ We assume no responsibility for the legal matters including, but not limited to, legal or title concerns.
4. This report is a general analysis of the project based on the scope mentioned in the report. This is not an Audit report, Design document, DPR or Techno feasibility study. All the information gathered is based on the facts seen on the site during survey, verbal discussion & documentary evidence provided by the client and is believed that information given by the company is true best of their knowledge.
5. This Techno Economic-Viability study is prepared based on certain futuristic assumption which are intra dependent on economic, market and sectorial growth condition in future and socio-economic, socio-political condition at macro and micro level.



6. Meeting of assumption and financial ratio will entirely depend on the sincerity and efforts of the company, promoters and its key managerial performance.
7. All observations mentioned in the report is only based on the visual observation and the documents/ data/ information provided by the client. No mechanical/ technical tests, measurements or any design review have been performed or carried out from our side during Project assessment.
8. This report has been diligently prepared by our techno-financial team to the best of their ability. However, it's important to note that the recommendations provided in this Total Economic Viability (TEV) assessment do not imply an endorsement, validation, or certification of the accuracy or completeness of the disclosed information by the involved stakeholders. Furthermore, we do not claim or endorse that the opinions presented herein are the sole best course of action for decision-makers to follow. There may exist additional approaches and inputs that have not been covered within this report or fall outside the scope of this report.
9. Bank/FII should **ONLY** take this report as an Advisory document from the Financial/ Chartered Engineering firm and its specifically advised to the creditor to cross verifies the original documents for the facts mentioned in the report which can be availed from the borrowing company directly.
10. In case of any default in loans or the credit facility extended to the borrowing company, R.K Associates shall not be held responsible for whatsoever reason may be and any request for seeking any explanation from the employee/s of R.K Associates will not be entertained at any instance or situation.
11. The documents, information, data provided to us during the course of this assessment by the client are reviewed only up to the extent required in relation to the scope of the work. No document has been reviewed beyond the scope of the work.
12. This report only contains general assessment & opinion as per the scope of work evaluated as per the information given in the copy of documents, information, data provided to us and/ and confirmed by the owner/ owner representative to us at site which has been relied upon in good faith. It doesn't contain any other recommendations of any sort including but not limited to express of any opinion on the suitability or otherwise of entering into any transaction with the borrower.
13. We have relied on data from third party, external sources & information available on public domain also to conclude this report. These sources are believed to be reliable and therefore,

we assume no liability for the truth or accuracy of any data, opinions or estimates furnished by others that have been used in this analysis. Where we have relied on data, opinions or estimates from external sources, reasonable care has been taken to ensure that such data has been correctly extracted from those sources and /or reproduced in its proper form and context, however still we can't vouch its authenticity, correctness or accuracy.

14. This Report is prepared by our competent technical team which includes Engineers and financial experts & analysts.
15. This is just an opinion report and doesn't hold any binding on anyone. It is requested from the concerned Financial Institution which is using this report for taking financial decision on the project that they should consider all the different associated relevant & related factors also before taking any business decision based on the content of this report.
16. All Pages of the report including annexure are signed and stamped from our office. In case any paper in the report is without stamp & signature then this should not be considered a valid paper issued from this office.
17. Though adequate care has been taken while preparing this report as per its scope, but still we can't rule out typing, human errors, over sightedness of any information or any other mistakes. Therefore, the concerned organization is advised to satisfy themselves that the report is complete & satisfactory in all respect. Intimation regarding any discrepancy shall be brought into our notice immediately. If no intimation is received within **15 (Fifteen) days** in writing from the date of issuance of the report, to rectify these timely, then it shall be considered that the report is complete in all respect and has been accepted by the client up to their satisfaction & use and further to which R.K Associates shall not be held responsible in any manner.
18. Defect Liability Period is **15 DAYS**. We request the concerned authorized reader of this report to check the contents, data and calculations in the report within this period and intimate us in writing if any corrections are required or in case of any other concern with the contents or opinion mentioned in the report. Corrections only related to typographical, calculation, spelling mistakes, incorrect data/ figures/ statement will be entertained within the defect liability period. Any new changes for any additional information in already approved report will be regarded as additional work for which additional fees may be charged. No request for any illegitimate change in regard to any facts & figures will be entertained.
19. R.K Associates encourages its customers to give feedback or inform concerns over its services through proper channel at valuers@rkassociates.org in writing within **15 days** of report delivery. After this period no concern/ complaint/ proceedings in connection with the

Techno- Economic Viability Study Services will be entertained due to possible change in situation and condition of the subject Project.

20. Our Data retention policy is of **ONE YEAR**. After this period, we remove all the concerned records related to the assignment from our repository. No clarification or query can be answered after this period due to unavailability of the data.
21. This Techno Economic Viability Study report is governed by our (1) Internal Policies, Processes & Standard Operating Procedures, (2) Information/ Data/ Inputs given to us by the client and (3) Information/ Data/ Facts given to us by our field/ office technical team. Management of R.K Associates never gives acceptance to any unethical or unprofessional practice which may affect fair, correct & impartial assessment and which is against any prevailing law. In case of any indication of any negligence, default, incorrect, misleading, misrepresentation or distortion of facts in the report then it is the responsibility of the user of this report to immediately or at least within the defect liability period bring all such act into notice of R.K Associates management so that corrective measures can be taken instantly.
22. R.K Associates never releases any report doing alterations or modifications from pen. In case any information/ figure of this report is found altered with pen then this report will automatically become **null & void**.
23. If this report is prepared for the matter under litigation in any Indian court, no official or employee of R.K Associates will be under any obligation to give in person appearance in the court as a testimony. For any explanation or clarification, only written reply can be submitted on payment of charges by the plaintiff or respondent which will be 10% of the original fees charged where minimum charges will be Rs. 15,000/.



EXTRACTS OF IMPORTANT STATUTORY APPROVALS PROVIDED BY THE CLIENT

PUNJAB ENERGY DEVELOPMENT AGENCY
(A Punjab Govt. Undertaking)

No. 8186-98
Dated: 4/9/23

Registered Post

M/s. W2Jwala Bioenergy Private Limited,
Level-4, The Summit Building,
SCO-203,204 & 205, Chandigarh
Ambala Highway
Zirakpur-140603
Mob. No. 9815278057, 9650297205
Email: benjamin@w2walabio.dk, vikram@w2walabio.dk,
devesh@w2walabio.in

Subject: Letter of Award (LOA) for setting up of Compressed Biogas (CBG) Project of capacity 12000 cum Raw Biogas per day (5 TPD CBG) based mainly on Paddy Straw, Cattle Dung and other bio-degradable waste in Tehsil: Dera Bassi, District: SAS Nagar to M/s. W2Jwala Bioenergy Private Limited, on Build Own & Operate (BOO) basis under Self-identified Scheme of NRSE Policy-2012.

Sir,

In reference to your Letter and application dated 08/05/2023 & 15/05/2023 received in PEDDA office on 25.05.2023 and financial documents submitted vide email dated 09/08/2023 from M/s. W2Jwala Bioenergy Private Limited, we are pleased to allot the setting up of Compressed Biogas (CBG) Project of capacity 12000 cum Raw Biogas per day (5 TPD CBG) based mainly on paddy straw, cattle dung and other Bio-degradable waste in Tehsil: Dera Bassi, District: SAS Nagar to M/s. W2Jwala Bioenergy Private Limited, on Build Own & Operate (BOO) basis under Self-identified Scheme of NRSE Policy-2012, on the following terms & conditions

1. The project is identified by your Company as self identified project and the Company is fully responsible for entire investment to be made for this project for its complete implementation & commissioning and further operational period including required land and raw material for the project.

SOLAR PASSIVE COMPLEX

PLOT NO. 1-2, SECTOR 33-D, CHANDIGARH (U.T.) : 160 034 Tel : 0172-2663328, 2663382
Fax : 0172-2662865 | Website : http://www.peda.gov.in
Punjab Energy Development Agency | pedda punjab | pedagov

PEDA : WORKING TOWARDS A SUSTAINABLE ENERGY FUTURE

ਦਫਤਰ ਤਹਿਸੀਲਦਾਰ , ਡੇਰਾਬੱਸੀ ।

W2JWALA BIOENERGY PRIVATE LIMITED,

ਨੰਬਰ: 183 ਮਿਤੀ: 12/11/2024

ਵਿਸ਼ਾ: ਬੈਂ ਵਰਤੋਂ ਹਥੀਲੀ ਸਰਟੀਫਿਕੇਟ ਜਾਰੀ ਕਰਨ ਬਾਰੇ।

ਵਿਸ਼ੇ ਦੇ ਸਬੰਧ ਵਿਚ ਹਲਕਾ ਪਟਵਾਰੀ ਤੇ ਰਿਪੋਰਟ ਪ੍ਰਾਪਤ ਹੋਈ, ਹਸਬ ਰਿਪੋਰਟ ਪਟਵਾਰੀ ਹਲਕਾ ਮੋਰੀ ਗਈ ਰਿਪੋਰਟ ਲੜੀਵਾਰ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਹੈ:-

1. ਮੁਤਾਬਿਕ ਜੇਕਰ ਰਿਕਾਰਡ ਜ਼ਮੀਨ ਖਾਤਾ ਨੰਬਰ-200/349 ਤੋਂ 350 ਦਾ ਖਸਰਾ ਨੰਬਰਾਂ:- 63 (4-0), 62 (4-0), 61 (4-0), 58 (4-0), 57/2 (3-6), 54/2 (2-12-10), 56/1 (0-16), 55/1 (0-14-8) ਕਿਤੇ 8 ਰਕਬਾ 23ਬਿਘੇ-8ਬਿਸਵੇ-18ਬਿਸਵਾਸੀ (ਸਾਲਮ) (ਮਲਕੀਤੀ ਨਿਰਮੇਲ ਸਿੰਘ ਪੁੱਤਰ ਅਜੈਬ ਸਿੰਘ ਦਾ 1/2ਹਿੱਸਾ ਵ ਗੁਰਬਿੰਦਰ ਸਿੰਘ ਪੁੱਤਰ ਨਿਰਮੇਲ ਸਿੰਘ ਦਾ 1/2ਹਿੱਸਾ) ਦੀ ਹੈ ਇਹਨਾ ਨੇ ਉਕਤ ਖਸਰਾ ਨੰਬਰ **W2JWALA BIOENERGY PRIVATE LIMITED** ਨੂੰ 27-09-2024 ਤੋਂ ਸ਼ੁਰੂ ਹੋਕੇ 15ਸਾਲ 8ਮਹੀਨੇ 9ਦਿਨ ਲਈ ਹਵੇਲੀ (ਅਸਫਤ 5ਜੂਨ 2040) ਇਸ ਜ਼ਮੀਨ ਤੇ ਕਬਜ਼ਾ **W2JWALA BIOENERGY PRIVATE LIMITED** ਦੀ ਹੈ।

ਇਸ ਨੰਬਰ ਖਸਰਾ ਖਸਰਾ ਨੰਬਰਾਂ:- 65 (4-0), 64 (4-0), 60 (4-0), 59 (4-0), 56/2 (3-4), 55/2 (4-5-12), ਕਿਤੇ 6 ਰਕਬਾ 23ਬਿਘੇ-9ਬਿਸਵੇ-12ਬਿਸਵਾਸੀ (ਸਾਲਮ) (ਮਲਕੀਤੀ ਗੁਰਮੇਲ ਸਿੰਘ ਪੁੱਤਰ ਅਜੈਬ ਸਿੰਘ ਦਾ 1/2ਹਿੱਸਾ ਵ ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਪੁੱਤਰ ਗੁਰਮੇਲ ਸਿੰਘ ਦਾ 1/2ਹਿੱਸਾ) ਦੀ ਹੈ ਇਹਨਾ ਉਕਤ ਖਸਰਾ ਨੰਬਰ **W2JWALA BIOENERGY PRIVATE LIMITED** ਨੂੰ 27-09-2024 ਤੋਂ ਸ਼ੁਰੂ ਹੋਕੇ 15ਸਾਲ 8ਮਹੀਨੇ 9ਦਿਨ ਲਈ ਹਵੇਲੀ (ਅਸਫਤ 5ਜੂਨ 2040) ਇਸ ਜ਼ਮੀਨ ਤੇ ਕਬਜ਼ਾ **W2JWALA BIOENERGY PRIVATE LIMITED** ਦੀ ਹੈ।

ਪਟੇ ਅਧੀਨ 46ਬਿਘੇ-18ਬਿਸਵੇ-10ਬਿਸਵਾਸੀ ਹੈ ਜਿਸ ਤੇ ਪਟੇਦਾਰ ਕਬਜ਼ਾ ਹੈ ਵਾਕਿਅਾ ਮੋਜਾ ਜੇਲਾ ਕਲਾ, ਤਹਿਸੀਲ ਡੇਰਾਬੱਸੀ, ਜ਼ਿਲ੍ਹਾ ਸਾਹਿਬਜ਼ਾਦਾ ਅਜੀਤ ਸਿੰਘ ਨਗਰ, "ਹਦਾਸਤ ਨੰਬਰ:-180" ਜਿਸ ਦੀ ਵਰਦ ਬਹੁਦੇ ਜਲਾਬੰਦੀ- ਸਾਲ 2021-2022 ਨਾਲ ਨਾਂਬੀ ਹੈ।

2. ਮਲਕੀਅਤ ਅਧੀਨ ਕੁੱਲ ਰਕਬਾ 46ਬਿਘੇ-18ਬਿਸਵੇ-10ਬਿਸਵਾਸੀ ਹੈ।

3. ਦਰਖਾਸਤ ਵਿਚ ਦਰਜ ਖਸਰਾ ਨੰਬਰ ਤੇ ਕੋਈ ਭਾਰ ਨਹੀਂ ਹੈ।

4. ਇਸ ਜ਼ਮੀਨ ਨੂੰ 5 ਭਾਣੇ ਦਾ ਰਸਤਾ ਲਗਦਾ ਹੈ। (ਫੁੱਟ 23 75) ਇਸ ਜ਼ਮੀਨ ਦੇ ਵਿਚੋਂ ਦੀ ਕੋਈ ਰਸਤਾ ਨਹੀਂ ਗੁਜਰਦਾ ਹੈ।

5. ਇਹ ਜ਼ਮੀਨ ਵਕਫ਼ ਬੰਡਰ, ਦੀ ਜਗ੍ਹਾ ਸਮਾਲਤ ਸਮਾਲਤ ਪੱਤੀ ਮੋਰਲਾਤ, ਕਸਟੋਡੀਅਨ ਜ਼ਮੀਨ ਅਤੇ ਮੁੜ ਵਸਾਉ ਵਿਭਾਗ ਨਾਲ ਕੋਈ ਸਬੰਧ ਨਹੀਂ ਹੈ।

6. ਇਸ ਜ਼ਮੀਨ ਨੂੰ ਕੋਈ ਕੁਦਰਤੀ ਨਾਸ਼ਾ ਜਾਂ ਭਰੇਨ ਨਹੀਂ ਲਘਦੀ ਹੈ।


7. ਉਕਤ ਰਕਬਾ ਮੁਸਤਫਕਾ ਖਾਤਾ ਨਹੀਂ ਹੈ ਮਾਲਕਾ ਦੀ ਨਿਜੀ ਮਾਲਕੀ ਹੈ।

TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED



भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises



UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER **UDYAM-PB-20-0074502**

NAME OF ENTERPRISE **W2JWALA BIOENERGY PRIVATE LIMITED**

TYPE OF ENTERPRISE *

S.No.	Classification Year	Enterprise Type	Classification Date
1	2024-25	Micro	08/06/2024

MAJOR ACTIVITY **MANUFACTURING**

SOCIAL CATEGORY OF ENTREPRENEUR **GENERAL**

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	W2jwala Bioenergy Private Ltd

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	Second Floor	Name of Premises/ Building	THE SUMMIT
Village/Town	VIL SIGHPURA	Block	SCO 205
Road/Street/Lane	CHANDIGARH-AMBALA HIGHWAY	City	ZIRAKHPUR
State	PUNJAB	District	SAS NAGAR, Pm 140603
Mobile	9650297205	Email:	devesh@jwalabio.in

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE **19/05/2023**

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

S.No.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	35 - Electricity, gas, steam and air conditioning supply	3520 - Manufacture of gas, distribution of gaseous fuels through mains	35201 - Manufacture of gas	Manufacturing

DATE OF UDYAM REGISTRATION **08/06/2024**

* In case of graduation (upward/reverse) of status of an enterprise, the benefit of the Government Schemes will be availed as per the provisions of Notification No. S.O. 2119(E) dated 26.06.2020 issued by the Mo MSME
Disclaimer: This is computer generated statement. no signature required. Printed from <https://udyamregistration.gov.in> & Date of printing - 08/06/2024

Office of Sub Registrar Sahib Dera Bassi

Lease Deed Land For First Before



E-Stamp paper issued Kirna Devi Pb7138804, Dera Bassi, bearing details E-Stamp Certificate No IN-PB61510108869056W Date: 27-09-2024


Period of Lease - 16 year
Average Annual Rent - Rs. 30,85,388/-
Stamp Duty - Rs. 1,85,200/-
Translated Version:

ਪੰਨਾਬ

ਦਰਾਬਸੀ ਸਬ ਰਜਿਸਟਰਾਰ ਸਾਹਿਬ ਡੇਰਾਬਸੀ

Paragraph No.	English Version	Translated Version (Gurmukhi)
A.	We, the individuals described below are Lessors:	ਅਸੀਂ, ਹੇਠ ਦਿੱਤੇ ਵਾਲੇ ਵਿਅਕਤੀ, ਲੀਜ਼ੋਰ ਹਾਂ:
	1. Nirmal Singh (PAN: IUAPS56218) Aadhar: 437312875167, son of Ajaib Singh, aged about 61, and his legal heirs	1. ਨਿਰਮਲ ਸਿੰਘ (PAN: IUAPS56218) ਆਧਾਰ: 437312875167, ਪੁੱਤਰ ਅਜੀਬ ਸਿੰਘ, ਉਮਰ ਲਗਭਗ 61, ਅਤੇ ਉਸਦੇ ਕਾਨੂੰਨੀ ਵਾਰਸ
	2. Gurmait Singh (PAN: IXKPS96540) Aadhar: 425273931742, son of	2. ਗੁਰਮੈਤ ਸਿੰਘ (PAN: IXKPS96540) ਆਧਾਰ: 425273931742, ਪੁੱਤਰ



TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED



इंडियन ऑयल कॉर्पोरेशन लिमिटेड
Corporate Office

इंडियन ऑयल कॉर्पोरेशन लिमिटेड
कॉर्पोरेट कार्यालय : एकोप कॉम्प्लेक्स, कोर-2
7, इंडिस्ट्रियल एरिया, लोधी रोड, नई दिल्ली-110003
Indian Oil Corporation Limited
Corporate Office: SCOPE Complex, Core-2
7, Institutional Area, Lodhi Road, New Delhi-110003
Website: www.iocl.com



Ref: IndianOil/SATAT/01/2283/A
Date: 07.12.2023

To,
W2Jwala Bioenergy Private Limited
The Summit, S. No. 205, 2nd Floor,
Village- Singhpura, Zirakpur, Punjab 140603

Sub: Letter of Intent for supply of CBG to IndianOil under SATAT
Madam/ Sir,

This has reference to the following:

Letter of Intent reference

Your request to transfer the LOI :

CBG plant location

CBG Quantity:

IndianOil/SATAT/01/2283 dated 30.06.2022
Request letter received vide e-mail dated
18.10.2023
Dera Bassi, District- SAS Nagar, Punjab
5 Tonnes Per Day

We also refer to documents submitted in the EOI and/or correspondences exchanged with IndianOil and your willingness to provide Compressed Bio Gas (CBG) to IndianOil from the above mentioned CBG plant for marketing through IndianOil's Retail Outlet(s).

Based on your request letter received vide e-mail dated 18.10.2023, we are transferring the LOI issued earlier to Ashok Benjamin Basil Attumaly vide ref: IndianOil/SATAT/01/2283 dated 30.06.2022 to W2Jwala Bioenergy Private Limited. The earlier Letter of Intent reference IndianOil/SATAT/01/2283 dated 30.06.2022 issued to Ashok Benjamin Basil Attumaly stands cancelled with effect from date of issuance of this LOI.

We hereby issue this Letter of Intent (LOI) for retailing of CBG produced from your above mentioned CBG Plant on following broad terms and conditions:-

1. In accordance with the Notice Inviting Expression of Interest (NIEOI) ref: CBG-46 released on 02.05.2022 against which earlier LOI dated 30.06.2022 was issued to Ashok Benjamin Basil Attumaly, you shall be responsible for, inter alia, the following obligations:

- You shall be responsible for planning, preparation, engineering and execution of the CBG Plant, including storage of raw material, operation and maintenance of the CBG Plant, maintaining final product output quantity and quality, managing the by-products and wastes from the CBG Plant as per existing central / state government norms and providing performance guarantee for the CBG Plant at your cost.

(contd.)

इंडियन ऑयल कॉर्पोरेशन लिमिटेड
Regd. Office: IndianOil Bhawan, G-9, AIYar Jung Marg, Bandra (E), Mumbai - 400051, Maharashtra
CIN: L23201MH1959GOC011385



INDIA NON JUDICIAL Chandigarh Administration

e-Stamp

Certificate No.	IN-CH49143564009526W
Certificate Issued Date	19-Apr-2024 12:53 PM
Certificate Issued By	chdevandu
Account Reference	NEWIMPACC (GVV) chspico / E-SAMPARK SEC-17 CH-CH
Unique Doc. Reference	SUBIN-CHCHSPICG0795985738707458W
Purchased By	AJAY
Description of Document	Article 5 Agreement or Memorandum of an agreement
Property Description	Not Applicable
Consideration Price (Rs.)	0
First Party	GAIL INDIA LIMITED
Second Party	W2JWALA BIOENERGY PRIVATE LIMITED
Stamp Duty Paid By	GAIL INDIA LIMITED
Stamp Duty Amount (Rs.)	100 (One hundred only)



TERM SHEET FOR PURCHASE OF BIOGAS / COMPRESSED BIOGAS (CBG) BETWEEN M/S W2JWALA BIOENERGY PRIVATE LIMITED AND M/S GAIL (INDIA) LIMITED

This Term Sheet ("Purchase Term Sheet") is executed on 25TH day of April 2024

W2Jwala Bioenergy Private Limited, (Biogas/CBG producer), a company incorporated under the laws of India and having its Registered Office at The Summit, S. No. 205, 2nd Floor, at Village- Singhpura, Distt. Zirakpur, State: Punjab (PIN: 140603) [CIN: NO. U35103PH2023F1C058577] (hereinafter referred to as the "Seller", which expression shall, unless the context requires otherwise, include its successors and permitted assigns);

AND

GAIL (India) Limited, a company incorporated under Companies Act, 1956 and having its registered

0021312019

TECHNO-ECONOMIC VIABILITY REPORT

M/S W2JWALA BIOENERGY PRIVATE LIMITED

W2JWALA BIOENERGY PRIVATE LIMITED
 Pathology & Energy C.O. - 103103PFB202437Y0000
 THE SUPPORT, 3, NO. 209, 2ND FLOOR
 VILL. SINDHUPUR, CHANDIGARH
 PIN-160021, PUNJAB - INDIA
 PHONE-90236
 WWW.W2JWALA.CO.IN

To
M/s Shivalik Solid Waste Management Limited
Regd. Office: Village Majra, P.O. Dabhota,
 Tehsil Nalagarh, district Solan, H.P.-174101
Zirakpur Office: S.C.O 20-21, 1st Floor,
 Shimla-Kalka Highway, Baltana, Zirakpur,
 District SAS Nagar, Punjab-140604
E-mail: rahul.varma@beil.co.in

20th December 2024

Subject: Work Order for providing consultancy services for upcoming largescale Bio-Gas project of **M/s W2Jwala Bioenergy Pvt Ltd**, Derabassi, District S.A.S. Nagar, Punjab.

Dear Sir,

Reference to the subsequent discussion had with you regarding the scope of work cited in the subject above. We are pleased to place this contract/work order on you as under:

1. SCOPE OF WORK:

- Form No. 1-C
- Form No. 1-D
- Form No. 1-E
- Form No. 1-F
- C.A. certificate of building cost estimate
- Prepare main building plan
- Building sections
- Building elevation plan

2. PROVISION OF FOLLOWING DOCUMENTS/CHECKLIST:

SR. NO.	DOCUMENTS
I	Registry Deeds / Deed of conveyance / Lease deed/Revenue Record
II	Flow Chart and brief description of the manufacturing process
III	Owner Documents (Adhar card and pan card)
IV	Factory pan card
V	NOC from fire department
VI	Pollution Consents (Air and Water)
VII	GST Registration Certificate
VIII	CA certificate year wise
IX	Old Approved Building plans factory act with approval letter (if any)
X	Invest Punjab log in and Password with Caf approved
XI	BOCW certificate

PUNJAB POLLUTION CONTROL BOARD
 Invest Punjab, PBIP, Udyog Bhawan, Sector 17, Chandigarh
 Website:- www.ppcb.gov.in

Office Dispatch No.: **PBIP/PPCB/2025/2523** Date: **19/02/2025**

To

ASHOK BENJAMIN BASIL ATTUMALY
BENS VILLA, ELAMANA JETTY ROAD, TRIPUNITHURA
ERNAKULAM, NULL - 682301

Subject: Grant of "Consent to Establish"(NOC) for an industrial plants u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981.

With reference to your application for obtaining fresh "Consent to Establish" (NOC) an industrial plants u/s 25 of Water & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are hereby permitted to establish the industrial plant to discharge the effluent & emissions arising out of your premises subject to the Terms and Conditions as specified in this Certificate.

1. Particulars of Consent to Establish (NOC) granted to the Industry

PIN	240572267
Application No.	2502974118
Date of Issue	19-Feb-2025
Date of Expiry	13-Dec-2027
Certificate Type	Fresh
Certificate No.	CTE/Fresh/PBIP/SAS/2025/2502974118

2. Particulars of the Industry

Name & Designation of the Applicant	Ashok Benjamin Basil Attumaly, (Chief Executive Officer)
Name of Business Entity	W2Jwala Bioenergy Private Limited
Name of the Project/Unit	Jwala Bioenergy Dera Bassi
Address of Project/Unit	Village Jaula Kalan, Hadbast 160, Tehsil Jera Bassi, District SAS Nagar, Pincode - 140501, Dera Bassi, S.A.S Nagar
Capital Investment of the Industry (in lakhs)	2752.6
Category of Industry	Green
Type of Industry	3071 A - CBO plants based on crop residue (sorghum, maize, grass, etc.) if discharge is (spillage/draw, wheat straw) corn straw / wastewater is more than 100 KLD
Scale of the Industry	Medium - > Rs. 10 Crore but < = Rs. 50 Crore
Office District	SAS Nagar
Consent Fee Details	Rs. 41,700/- vide Ref. No. N3452438486, BGS dated 10.12.2024
Raw Materials (Name with quantity per day)	Feedly Straw @ 40 Metric Tonnes/Day, Cow Dung @ 50 Metric Tonnes/Day, Litter @ 10 Metric Tonnes/Day

TECHNO-ECONOMIC VIABILITY REPORT M/S W2JWALA BIOENERGY PRIVATE LIMITED



ISGEC HEAVY ENGINEERING LTD.

A-4, Sector-24
Noida - 201301, U.P., India
GST No.: 09AAAC1854OR2241
Tel.: +91-120-4084000 ext. 102
E-mail: xydsales@isgec.co.in
www.isgec.co.in

X-1 (NZ)/C

17th February, 2025

M/s. W2Jwala Bioenergy
Dera Bassi
State: Punjab
Email: subodh.rao@wjalabio.in

Ref.: Revised Technical Offer, civil details and layout dated 5th February, 2025.

Sub: Revised Commercial offer for 05 TPD (6800 Nm3) Compressed Biogas (CBG) Output.

Dear Sir,

This is with above reference.

2.0 Accordingly, here below submit our price offer consisting of following annexure:

- 2.1 ANNEXURE- VI Price Schedule
- 2.2 ANNEXURE- VII Terms and Conditions

3.0 Scope of supply, technical specifications, exclusions, terminal points and other terms and condition shall be as per our **Technical Offer, civil details and layout dated 5th February 2025.**

Thanking you and assuring our best services and co-operation.

Yours faithfully,

SANJAY AWASTHI
CHIEF EXECUTIVE
xydsales@isgec.co.in

Encl: Annexure-VI & VII

D:\DATA BACKUP\DATA\W2Jwala Bioenergy\Technical\250217 - Comen Offer for 5 TPD CBG Plant - W2Jwala Bioenergy.docx

3

Sprinkled not stained!

OUR OFFER FOR YOUR PROJECT

Biogas Plant
SS Maxi - Jwala - India

Proposal number: 190012
Date: 24.01.2025

Your consultant for Sauter Biogas System
Sprinkled not stained!

Mr. Subodh Kumar
Cellphone: +91 9712 987045
E-mail: s.k.sauter@sauteer-biogas.de

These documents are created by
Mr. Subodh Kumar
Phone: +91 9712 987045
E-mail: s.k.sauter@sauteer-biogas.de

Sauter Biogas System
190012 - SS Maxi - Jwala - India
24.01.2025

Management Board
SS Maxi - Jwala - India
24.01.2025

Working Document
SS Maxi - Jwala - India
24.01.2025

Design Envelope ID: 5A5E70A5-2F00-4A5F-8AEC-02360007
W2JWALA BIOENERGY PRIVATE LIMITED
Regd. Office: S. No. 205, 2nd Floor, Village: Singhpura, Zirakpur, S.A.S Nagar (Mohali), Punjab - 140603
VILL. SINGHPURA, ZIRAKPUR
MOHALI, PUNJAB - 140603
0982-503796
info@w2jwala.co

LETTER OF INTENT

Ref. DERABASSI/19/05/LOVISGEC 17th February 2025

ISGEC Heavy Engineering Ltd.
A- 4, Sector - 24,
Noida - 201301 (U.P.)

Dear Sirs,

Whereas, W2Jwala Bioenergy Pvt. Ltd. ("Jwala Bioenergy") had issued an RFQ (Enclosure 1) on 22.08.2024 to several EPCs soliciting offers for the construction of a 5 Tons Per Day (TPD) Compressed Biogas (CBG) plant in Dera Bassi, Punjab;

Whereas, ISGEC Heavy Engineering Ltd. (the "EPC") had responded to the RFQ with a comprehensive technical offer and a corresponding commercial offer;

Whereas, Jwala Bioenergy and the EPC had engaged in several rounds of collaborative discussions to optimize the scope and adjust the commercial offering;

Whereas, basis the above discussions, the technical offer was revised, the latest being represented by Enclosure 2 and Enclosure 3 dated [05.02.2025];

And whereas, basis the above discussions, the commercial offer was further revised, the latest being represented by Enclosure 4 dated [17.02.2025];

Therefore, the management of Jwala Bioenergy has decided to give a provisional go-ahead to place the order for design, engineering, manufacturing, procurement, transport, erection and commissioning of machinery, equipment and civil structures for our 5 TPD CBG plant in Dera Bassi on a turnkey basis with the EPC. This Letter of Intent is intended as a written communication of our intent.

The price basis for this decision is **Rs. 37.75 crores for turnkey construction (Indian Rupees Thirty Seven Crores And Seventy Five Lakhs only)**, following the indicative payment schedule given in Enclosure 5 dated [14.02.2025]. The applicable taxes, duties & any cess shall be paid extra at actuals by us.

Whilst this is a signaling of our clear intent, the EPC is not expected or obligated to start any works, including preparatory activities on the basis of this LOI, and neither is Jwala Bioenergy obligated to make payments. We intend to negotiate the terms of the EPC contract in good faith with the EPC with the aim of signing the contract within Q4 FY24-25.

Further, we note that

1. Work commencement, including any preparatory activities, shall be conditional upon the mutual execution of the final contract and release of the first payment.

M/s. W2Jwala Bioenergy Private Limited, having its registered office at The Summit - Regus, S. No. 205, 2nd Floor, Village: Singhpura, Zirakpur, S.A.S Nagar (Mohali), Punjab - 140603 (for short "**Biogas/ CBG Producer**" or "**Producer**") which expression shall, where the context so admits, be deemed to include its successor-in-office and assigns.

AND

M/s. IndianOil-Adani Gas Private Limited, having its registered office at Room No G-04, Indian Oil Bhawan 1, Sri Aurobindo Marg, Yusuf Sarai, New Delhi, 110016 (for short "**CGD Entity**") which expression shall, where the context so admits, be deemed to include its successor-in-office

AND

GAIL (India) Limited, a company duly incorporated under the provisions of Companies Act, 1956, having its registered office at 16, GAIL Bhawan, Bhikaiji Cama Palace, P.O. - R.K. Puram, New Delhi - 110066, India, (for short "**GAIL**"), which expression shall, unless the context otherwise requires, includes their successors in office and assignees thereof.

Producer, CGD Entity and GAIL are individually referred to herein as a "**Party**" and collectively as the "**Parties**".

WHEREAS:

- GAIL is one of the largest natural gas processing, transporting, marketing and distribution company in India, being a state-owned enterprise of the Government of India, under the administrative control of the Ministry of Petroleum & Natural Gas.
- That Ministry of Petroleum & Natural Gas, Government of India (in short "**MoP&NG**"), in furtherance of guidelines dated 03.02.2014 and 20.08.2014 (as amended), has vide letters No. L-16022/05/2020-GP-I (E-35118) dated 09.04.2021, 26.10.2021 and 26.10.2023 issued policy guidelines (in short "**Approval**") for synchronisation of CBG produced by plants under SATAT scheme in the CGD network wherein GAIL has been mandated to operationalise the CBG-CGD Synchronisation Scheme and supply Biogas/CBG co-mingled with domestic gas at Uniform Base Price (UBP) to CGD entities for use in CNG (T) &and PNG (D) segments of CGD network.
- That in view of the MoP&NG approval, Producer, CGD Entity and GAIL are entering into this Tripartite Agreement ("**TPA**") to supply Biogas/CBG produced by Producer to CGD Entity.
- That the CGD Entity has requested GAIL to supply domestic gas for its authorized Geographical Area Chandigarh [GA-2.01] in the state of Chandigarh, Haryana, Punjab & Himachal Pradesh
- That a Gas Sale and Transportation Agreement dated 22.07.2021 for supply of APM gas has been executed by and between GAIL and CGD Entity ("**APM GSTA**") and a Non-APM Gas Sale and Transportation Agreement dated 24.07.2021 has been executed between GAIL and CGD Entity for supply of Non-APM gas to the CGD Entity ("**NAPM GSTA**").

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