

File No.: VIS (2024-25)-PL409-359-484

TECHNO-ECONOMIC VIABILITY STUDY REPORT

OF

**2.5 TPD COMPRESSED BIO GAS PLANT
(6,250 METRIC CUBE PER DAY BIOGAS)**

SETUP BY

**M/S ZAK RENEWABLES VENTURES PRIVATE
LIMITED**

(PROMOTED BY: M/S ZAK VENTURES PVT LTD)

REPORT PREPARED FOR

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations
- Lender's Independent Engineers (LIE)
- Techno Economic Viability Consultants (TEV)
- Agency for Specialized Account Monitoring (ASM)
- Project Techno-Financial Advisors
- Chartered Engineers
- Industry/ Trade Rehabilitation Consultants
- NPA Management

M/S ZAK VENTURES PVT LTD

FLAT NO. - LINC 905, GRAND OMAXE EXPRESSWAY, SECTOR 93-B,

NOIDA - 201304, UTTAR PRADESH, INDIA

***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.*

**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.**

File No.: VIS (2024-25)-PL409-359-484
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TECHNO-ECONOMIC VIABILITY REPORT

M/S ZAK VENTURES RENEWABLE PRIVATE LTD

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PART A

REPORT SUMMARY

S. No.	PARTICULAR	DESCRIPTION
1.	Name of the Company:	M/s ZAK Ventures Renewable Pvt Ltd
2.	Registered Address:	Flat No.- Linc 905, Grand Omaxe Expressway, Sector 93-B, Noida - 201304, Uttar Pradesh, India
3.	Project Name	2,500 Kg per day Bio CNG generating plant.
4.	Project Location:	Khasra No. 946, Village Bhadoli Ghaziabad Uttar Pradesh-201206
5.	Project Type:	Bio CNG generating plant along with Fermented organic solid manure/fertilizer
6.	Project Industry:	Renewable Energy
7.	Product Type / Deliverables:	Bio CNG, Fermented organic solid manure/fertilizer
8.	Report Prepared for Organization:	M/s. ZAK Ventures Pvt Ltd Flat No.- Linc 905, Grand Omaxe Expressway, Sector 93-B, Noida - 201304, Uttar Pradesh, India
9.	TEV Consultant Firm:	M/s. R.K Associates Valuers & Techno Engineering Consultants (P) Ltd.
10.	Report type:	Techno-Economic Viability Report
11.	Purpose of the Report:	To assess Technical & Economic Viability for the purpose of seeking external financial assistance to start a green field CBG Project.
12.	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.												
13.	Date of Report:	15 th November, 2024												
14.	Documents referred for the Project:	<p>A. PROJECT INITIATION DOCUMENTS:</p> <ul style="list-style-type: none">1. Detailed 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. List of Expected Raw material Supplier3. Process Flow Chart4. Sanction/proposed map of the sites5. Lease/Sale deeds of the Land <p>C. STATUTORY APPROVALS, LICENCES & NOCs</p> <ul style="list-style-type: none">a. MSME UDYAM Registration Certificateb. NOC from Gram Panchayatc. NOC/Application for Ground waterd. Consent to establish approvale. NOC from PESO												
15.	Means of Finance:	Equity & Debt (D/E Ratio 1.56 TPC)												
16.	Key Financial Indicators:	<table><tr><th>Key Indicators</th><th>Value</th></tr><tr><td>Average DSCR</td><td>1.78</td></tr><tr><td>Average EBITDA Margin</td><td>29.96%</td></tr><tr><td>Avg. PAT Margin</td><td>15.48%</td></tr><tr><td>NPV & IRR</td><td>INR 9.05 Cr. & 16.71%</td></tr><tr><td>Payback Period</td><td>8.30 years</td></tr></table>	Key Indicators	Value	Average DSCR	1.78	Average EBITDA Margin	29.96%	Avg. PAT Margin	15.48%	NPV & IRR	INR 9.05 Cr. & 16.71%	Payback Period	8.30 years
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Avg. PAT Margin	15.48%													
NPV & IRR	INR 9.05 Cr. & 16.71%													
Payback Period	8.30 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, 2,500 kg/day) at Khasra No. 946, Village Bhadoli Ghaziabad, Uttar Pradesh-201206 to be set up by M/s ZAK Ventures Renewable Private Limited.

2. EXECUTIVE SUMMARY:

Ministry of Petroleum and natural Gas launched a scheme called SATAT i.e. Sustainable alternative towards affordable transportation, on 2nd October 2018. Under this scheme Government of India is expecting to set up 5000 CBG plants which can produce 15 million tonnes of CBG per annum by 2023, which is about 40% of current CNG consumption of 44 million tonnes per annum in the country. Being the reservoir of biomass of various types, India has potential to produce 62 million tonnes of CBG which can make it energy surplus country.

As per data/information provided by the client, this 2.5 TPD CBG plant was initiated by M/s Sobti Engineering Works Pvt. Ltd, 7/12, 3rd Floor, South Patel Nagar, New Delhi, District: Delhi, Delhi, 110008. M/s Sobti Engineering Works Pvt. Ltd. had sold out this under construction project to M/s ZAK Ventures Pvt Ltd through signing an agreement dated 16th May 2024, according to which seller has developed a 2.5 MTPD CBG plant at Khasra No. 946, Village Bhadoli Ghaziabad Uttar Pradesh-201206 and proposes to sell the same along with the land measuring 6070 Sq. Mt. which has been mortgaged with south Indian bank against the loan value of INR 1.94 Crore to the purchaser.

Further, M/s ZAK Ventures Pvt Ltd as the new owner of this 2.5 TPD CBG plant situated at Khasra No. 946, Village Bhadoli, Muradnagar, Ghaziabad Uttar Pradesh, 201206 on 6070 Sq. Mt. of land including all infrastructure and facilities has transfer the ownership and operational responsibility of assets to its subsidiary company M/s ZAK Ventures Renewable Private Limited through an Assets Transfer Agreement signed between the parties dated 14th October 2024.

Currently, Promoters of the project are Mr. Kashif Hasan (Managing Director of ZVPL & holding 13 years of experience in Natural Gas Business), Mr. Mohd. Babar (holding 15 year of experience in in Business Management, Operation management and execution of Techno-

Commercial Operations) and Mrs. Pinky Qaiser, where M/s ZAK Ventures Pvt Ltd and Mr. Kashif Hasan are having 80% & 20% shareholding in the company respectively.

The transport sector forms the backbone of the economy in the country. It accounts for 30% of global energy use & 14% of the total CO₂ emission. At present, it is heavily dependent on oil and so is extremely vulnerable to changes in oil prices. Hence use of biogas as vehicular fuel makes a perfect case for biogas projects to achieve a sustainable future.

Promoters of the Company have captured this under construction Greenfield Project to reap out the opportunity of 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" for providing green energy.

The project is proposed to be set up at Khasra No. 946, Village Bhadoli Ghaziabad Uttar Pradesh, 201206 for the production of 2,500 Kg/ Day of Bio-CNG (compressed biogas) along with 15 Ton/day of fermented solid organic fertilizer which will be sold as value added by-products.

Proposed Biogas Plant Capacity			
Sr. No.	Particular	Capacity	Unit
1	Bio-CNG Plant Design Capacity	6,250	M3/Day
3	Bio-CNG Plant Running Capacity	2,500	kg/Day
4	Fermented solid organic fertilizer	15,000	Kg/day

Source: DPR/data/information provided by the company

The project is proposed to be commissioned based on the sophisticated and proven Anaerobic Digestion CSTR technology. Anaerobic digestion is a renewable energy generation process in which micro-organisms break down biodegradable material in the absence of oxygen. Anaerobic digestion technology was developed and commercialized long back in Europe and is technically considered a low-risk, high-output technology.

As per the data/information provided by the client, Company has decided to procure all the equipment, Plant & Machinery by their own and Building & Civil work, electrical, instrumentation & data collection work etc. will be done by using their in-house technical team who are having expertise in the same domain.

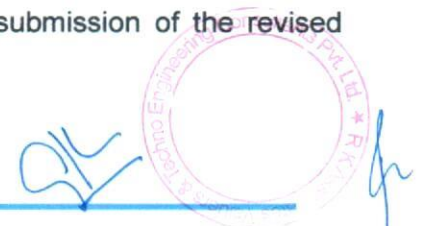


For the sale of the produced CBG, the company has already secured a LOI from Indraprastha Gas Limited under *(A joint Venture of GAIL, BPCL & Govt. of NCT Delhi)* SATAT initiative to promote Compressed Bio-Gas as an alternative, green transport fuel. **(Ref No.: IGL/SATAT/07/19A Dated: 04.12.2023)** for which company has paid bank guarantee of INR 5.00 lakhs to IGL via SBI (Ref: BG No. 6119524BG0000071 dated 08th August 2024). It is to be noted that LOI has been signed by ZVPL with OMC which needs to be changed in the name of ZVRPL since M/s ZAK Ventures Pvt Ltd has transfer the ownership and operational responsibility of assets to ZVRPL. Commercial agreement will be signed before C.O.D between the parties.

As per the agreement to sell dated 16th May 2024, this partially constructed CBG facility has been purchased by the company from M/s Sobti Engineering Works Pvt. Ltd with the land measuring 6070 Sq. Mt. at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh – 201206. As per the land deed Ref: G-11849 Dated: 10-10-2019 shared by the client, land is in the name of Sobti Engineering Works Pvt. Ltd at present for which CLU was obtained on 11th Aug 2020 from sub-divisional magistrate, Modinagar. Ownership of the land needs to be transfer in the name of M/s ZAK Ventures Renewable Pvt Ltd. We recommend the bank to suggest the client for submit the revised ownership details of the land as and when it's required before disbursement.

Proposed layout plan has been prepared by M/s Sobti Engineering Works Pvt. Ltd which will be as it is used by ZVRPL as there is no any changes in the project implementation. Company need to obtain the approval of the proposed layout plan from respective Industrial Development Authority. As per the shared data/information by the client, NOC from the Gram Panchayat has already been taken by the Sobti Engineering from *Gram Panchayat - Bhadauli, Development Block – Bhadauli, District Gaziabaad* which needs to be change in the name of M/s ZVRPL.

As per data/information provided to us, M/s Sobti Engineering Works Pvt. Ltd has obtained some Statutory Approvals/NOC's such as NOC from village panchayat, Consent to Establish, PESO approval, Fire NOC etc. from the respective authorities *(Refer the section Statutory Approval in the later part of the report)*. It is to be noted that all the approvals/NOCs are taken in the name of Sobti Engineering for the proposed CBG plant which needs to be reapply or transfer in the name of M/s ZAK Ventures Renewable Pvt Ltd. We recommend the bank/financial institution in this regard to suggest the client for submission of the revised copy of approval/NOCs.



During the site visit dated 26th Sep 2024, we found that the Wall has been casted and plaster work is due at site. Partially constructed 6500 m3 RCC Digester sold by Sobti to ZVPL is completed. Super structure of Admin office has been completed and finishing work is in progress. Shed work has been completed and currently is in use. *(Kindly refer the site pictures captured during the survey attached in the later section of the report).*

As per the provisional estimation of power shared by the client, ~350 KWA of power load connection will be required to run the proposed CBG plant. Currently, the company is in the process to apply for power load connection. NOC for ground water extraction will be applied by the company in due course. Company has planned to achieve the C.O.D by 1st July 2025.

Further, the cost of the proposed project from scratch to trial run is being estimated as INR 16.26 Crore, which is proposed to be funded through promoter's equity of INR 6.35 Crore and bank loan of INR 9.91 Crore.

At present, the company is in discussion with Financial Institutions to fund the project through a term loan of INR 9.91 Crore. In this regard M/s ZAK Ventures Private Limited (Promoters) has appointed R.K. associates to assess the Techno-Economic Viability of the proposed CBG plant. The company plans to achieve the financial closure by November, 2024 (expected).

3. PURPOSE OF THE REPORT:

To assess Project's Technical and Financial Feasibility for Client'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 ZAK Ventures Renewable Private Limited as per the data/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.*

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Techno Engineering Consultants Pvt. Ltd.

- *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.*
- *Any review of the existing business of the promoters is out of scope of this report.*
- *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.*

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. Babar Shah (Director) and the required details about him shown in the below table:

Particulars	Details
Designation	Director
Company	M/s ZAK Ventures Renewable Private Limited
Email Address	bd@zakventure.com
Contact No.	+91-9654953201

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. Long term Raw Material Supply agreement with FPO.
- f. Selling, Marketing & Distribution Plan, LOI with the OMC.
- g. Site/Layout Plan
- h. Sale/Lease deed of the land
- i. Agreement to Sale with M/s Sobti Engineering Pvt Ltd
- j. Agreement to transfer of asset to M/s Zak Ventures Renewable Pvt. Ltd.
- k. Certificates of Statutory approvals/NOC's.
- l. Survey Report.

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PART C

COMPANY PROFILE

1. COMPANY OVERVIEW:

As per data/information available on MCA, Company was established on 25th November 2020 with the name "Zak Venture CBG (Karnal) Private Limited" under the Company's Act, 2013 as a Non-government company limited by shares and name of the company has been changed from Zak Venture CBG Private Limited to Zak Venture Renewables Private Limited with effect from 20th January 2020 as per Certificate of Incorporation pursuant to change of name shared by the client/Company. Below table shows the incorporation details of the company:

Incorporation Details of the Company	
Particular	Description
Company Name	M/s ZAK Ventures Renewable Private Limited
CIN	U40106UP2020PTC138480
Date of Incorporation	25 th November 2020
Registration Number	138480
ROC Name	ROC Kanpur
Company Category	Company limited by shares
Company Subcategory	Non-government company
Class of Company	Private
Registered Address	LINC 905, Grand Omaxe Expressway Sector-93b, Gautam Buddha Nagar, Noida, Uttar Pradesh, India, 201304
Authorized Capital	INR 10,00,000
Paid up Capital	INR 1,00,000
Date of last AGM	30/09/2023
Date of Balance Sheet	31/03/2023
Company Status	Active

Source: Information extracted from MCA website & public domain

As per the Memorandum of Association (MoA) dated 25th November 2020 shared by the client, the objects to be pursued by the company on its incorporation are to plan, engineer, construct, finance, develop, operate, improve, manage, modify, run work, purchase, sell, take on lease, lease otherwise acquire an interest in invest in divest, contract service and otherwise deal in and with the product of mines, mining facilities, mining lands, mining

equipment, dredges, beneficiation plants processing plants, refractories, refineries, quarries, stockpiles, washeries, power generation equipment, co-generation dams, water supply & treatment plants, road, bridges, offices, workshops, hotels, public health facilities, hospitals, housing, schools, communications facilities, towns, wharves, shipping facilities, shipping services, port facilities, transshipping, barges, railways, rail stock aircraft, warehouses, laboratories, pollution control system rehabilitation operations, manufacturing plant and all ancillary plant, equipment and operations as also to plan, develop, manufacture, produce and setup ethanol and Biogas such as CBG plant, Biogas to power plant, Biomass based projects.

To buy, import, export, sell and generally deal in modern agriculture implements, fertilizers and all type of plant foods, pesticides, insecticides, fungicides, and all type of plant protection chemicals and all kind of agricultural chemicals used for agricultural purposes as fertilizers, pesticides, insecticides, fungicides etc. to carry on the said business in all their branches and/or to undertake spraying of such chemicals through manual, mechanical and/or aerial operations alone or in association with other agencies/companies.

The company is categorised as micro enterprise with Udyam Registration Number *UDYAM-UP-28-0010101* dated 29th December 2020. In this company, the promoters have proposed to setup 2,500 Kg/Day of Bio-CNG (compressed biogas) plant along with 15 Ton/day of fermented solid organic fertilizer.

2. PROPOSED SHAREHOLDING PATTERN:

As per the data/information provided by the client, shareholding pattern of the company is shown in the table below as on 14th October 2024:

List of Shareholders of ZAK Venture Renewables Pvt Ltd.						
S. No.	Name of Director's	Designation	PAN No	DIN	Address	Share Holding %
1	Mr. Kashif Hasan	Director & Shareholder	ACTPH7080C	7431135	C-905, Lincoln Tower, Grand Omaxe, Sector 93-B, Noida, U.P.-201304	20%
2	M/s ZAK Venture Pvt Ltd	Shareholders	AAACZ9321J		Office No-2502, 5th Floor, Tower-2, Express Trade	80%

					Tower 2, B-36, Sector-132, Noida-201301	
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Source: Data/Information provided by the client.

3. KEY PROMOTER'S/DIRECTORS PROFILE:

Mr. Kashif Hasan, Mr. Mohd. Babar and Mrs. Pinky Qaiser are the directors of M/s Zak Ventures Renewable 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:

Name	Designation/ DIN	Address & Contact Details	Appointment Date	Qualifications/Experience
Mr. Kashif Hasan	Director DIN: 07431135	C-905, Lincoln Tower, Grand Omaxe, Sector 93-B, Noida, U.P.-201304 +91 8595 8568 70 <a href="mailto:md@zakventur
e.com">md@zakventur e.com	25/11/2020	<p>As a Managing Director of ZVRPL, he is an engineering graduate from National Dairy research Institute (NDRI), Karnal (Haryana) and an MBA in Marketing from S P Jain Institute of Management & Research, Mumbai (Maharashtra).</p> <p>He has an experience of more than 13 Years in various aspects of Natural Gas business including, but not limited to, pipeline laying, LNG/R-LNG trading, Consulting City Gas Distribution (CGD) companies in India, Commercial Contract management etc.</p> <p>Held key roles in marketing of natural gas for GAIL (India) Limited, a leading Indian integrated energy company, for more than 7 years.</p>

				Signed various MoUs with Government departments and with PSUs for developing projects in renewable energy sector.
Mr. Mohd. Babar	Director DIN: 06427087	D-36, 2nd Floor, Flat No-201, Street No-28, God Grace School, Abul Fazal Enclave, Delhi- 110025 +91- 9654953201 (<a href="mailto:bd@zakventur
e.com">bd@zakventur e.com)	10/10/2024	<p>Engineering graduate from Faculty of Engineering and technology, JMI with master's in marketing from Welingkar Institute of Management Development & Research, Mumbai.</p> <p>He is 38 years old and has over 15 years of experience in handling small to mid-size business with specialization in Business Management, Operation management and execution of Techno-Commercial Operations.</p> <p>Responsible to accrue and expand Company's business by providing solutions on Renewable Energy and Natural Gas sector. Implementation & understanding the need of current industry situation, associated market dynamics & monitoring the policies.</p>
Mrs. Pinky Qaiser	Director DIN: 06436683	C-905, Lincoln Tower, Grand Omaxe, Sector 93-B, Noida, U.P.-201304	10/10/2024	<p>Mrs. Pinky Qaiser is a skilled professional with 10 years of experience in handling administration and human resources. She is a graduate who</p>

		+91- 8527779516 afreen.qaiser@hotmail.com		has developed expertise in overseeing HR functions, managing administrative operations, and ensuring the smooth execution of daily business activities. Her strong organizational skills, attention to detail, and ability to manage both people and processes effectively make her an asset in corporate environments.
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Source: Data/Information provided by the client

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. KASHIF HASAN DIN: 7431135)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of Appointment	Date Of Appointment at Current Designation
1	Zak Venture Biofuels Private Limited (U23201UP2022PTC166053)	Director	20/06/2022	20/06/2022
2	Zak Venture Private Limited (U24233UP2016PTC077163)	Director	14/03/2016	14/03/2016
3	Zak Venture Renewables Private Limited (U40106UP2020PTC138480)	Director	25/11/2020	25/11/2020
4	Natural Gas India Private Limited (U23300UP2020PTC139374)	Director	-	10/04/2024
5	Biomethane Gaztech Private Limited (U40106UP2020PTC138524)	Director	-	26/11/2020
6	S H Multiservices Private Limited (U74140DL2015PTC283013)	Director	-	31/03/2021
7	Munchology Foods Private Limited (U74999UP2018PTC110731)	Director	-	29/11/2018
8	Natural Gas India Private Limited (U23300UP2020PTC139374)	Director	-	17/12/2020

9	Alsay Gastech Private Limited (U24239UP2019PTC115430)	Director	-	02/04/2019
10	Almatin Energy Private Limited (U24299UP2019PTC116186)	Director	-	24/04/2019

Source: Information extracted from MCA website & public domain

(MR. MOHD BABAR DIN: 06427087)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of Appointment	Date Of Appointment at Current Designation
1	Zak Venture Renewables Private Limited (U40106UP2020PTC138480)	Director	10/10/2024	10/10/2024
2	Natural Gas India Private Limited (U23300UP2020PTC139374)	Director	14/08/2023	14/08/2023
3	Biomethane Gaztech Private Limited (U40106UP2020PTC138524)	Director	20/01/2023	20/01/2023
4	Zak Venture Private Limited (U24233UP2016PTC077163)	Director	20/01/2023	20/01/2023
5	Greenwelt Energy Private Limited (U51502DL2012PTC246006)	Additional Director	14/08/2013	14/08/2013

Source: Information extracted from MCA website & public domain

(MRS. PINKY QAISER DIN: 06436683)

S. No	Company Name (CIN/FCRN)	Designation	Original Date of Appointment	Date Of Appointment at Current Designation
1	Zak Venture Renewables Private Limited (U40106UP2020PTC138480)	Director	10/10/2024	10/10/2024
2	Zak Venture Private Limited (U24233UP2016PTC077163)	Director	14/03/2016	14/03/2016
3	Indo Global Medicare Private Limited (U85100DL2013PTC248268)	Director	14/02/2013	14/02/2013
4	Biomethane Gaztech Private Limited (U40106UP2020PTC138524)	Director	26/11/2020	26/11/2020
5	Natural Gas India Private Limited (U23300UP2020PTC139374)	Director	-	17/12/2020
6	Zak Venture Renewables Private Limited (U40106UP2020PTC138480)	Director	-	25/11/2020

Source: Information extracted from MCA website & public domain

PART D

PROPOSED INFRASTRUCTURE DETAILS

1. PROPOSED PLANT LOCATION:

As per the agreement to sell dated 16th May 2024, the proposed under construction Bio-CNG generating plant was purchased from Sobti Engineering works Pvt Ltd along with land measuring 6070 Sq. Mt. at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh – 201206 as per the sale deed provided to us by the Client/Company.

The Ghaziabad district on the western edge of Uttar Pradesh, is located between Ganges and Yamuna. This district is one of the developed districts of Uttar Pradesh and its boundary is well connected through the national capital of Delhi. Due to well-connected from Delhi, the main road of entry into Uttar Pradesh, Ghaziabad is said to be the gateway of Uttar Pradesh. The Geographical Area of District Ghaziabad is 777.9 Sq. Km on the basis of 2011 census.

S. No.	Particular	Description
1.	Number of Cattle as per Live Stock Census 2019	Exotic – 80280 Indigenous – 19920 Total - 100200 (www.animalhusb.upsdc.gov.in)
2.	Number of Buffalo as per Live Stock Census 2019	Male – 23592 Female – 190128 Total – 213720 (www.animalhusb.upsdc.gov.in)
3.	Number of Poultry as per Live Stock Census 2019	159515 (www.animalhusb.upsdc.gov.in)

Land use pattern of the district	Area('000ha)
Geographical area	206.93
Cultivable area	143.93
Forest area	3.542
Land under non-agricultural use	38.95
Permanent pastures	0.09
Cultivable wasteland	2.93
Land under Misc. tree crops and groves	0.19
Barren and uncultivable land	4.09

The location of the plant is in the well-known sugarcane belt of the western Uttar Pradesh, where accessibility of agricultural land for cultivating the Sugarcane & Napier grass is sufficient. Availability of the required raw material is the advantage of the proposed location as many Sugar mills are situated near by the location as shown in the below table:

S. No.	Name of the Sugar Mill	Distance from location
1.	Modi Distillery Modi Sugar Mill	~18 km away
2.	Mohiuddinpur Sugar Mill Meerut	~ 34 km away
3.	Baleni Sugar LLP	~27 km away
4.	Baghpat Sugar mill	~46 km away
5.	Daurala Sugar Mill (DCM Shriram Industries Ltd.)	~57 km away

Source: Google Map

S. No.	Nearby Dairy Farms	Distance from location
1.	KK Dairy Farm	~9.1 km away
2.	Kanha Dairy farm	~ 16 km away
3.	Chaudhary Dairy Farms	~19 km away
4.	Ramlata Dairy Farm	~23 km away
5.	Laxmi Dairy Farm	~7 km away

Source: Google Map

During the site visit dated 26th Sep 2024, we found that the plant is under construction and Property is Commercial property for which CLU was obtained on 11th Aug 2020 from sub-divisional magistrate, Modinagar. Demarcation of land is done. Boundary Wall has been casted and plaster work is due at site. Partially constructed 6500 m3 RCC Digester sold by Sobti to ZVPL is completed. Super structure of Admin office has been completed and finishing work is in progress. Shed work has been completed and currently is in use.

The property is having the proximity to the civic amenities such as hospital is situated ~6 km away, Metro is just ~4 km away and market is situated ~6 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:

Location	Details
East	Kaccha Road
West	Brick Bhatti
North	Road
South	Village Road

Table: 2 Connectivity Details of the Proposed Location	
Connectivity	Details

Road	Eastern peripheral highway - ~2 km away
Rail	Duhai Halt Railway station - ~7 km away
Airport	Indira Gandhi International Airport - ~50 km away

2. LOCATION MAP:

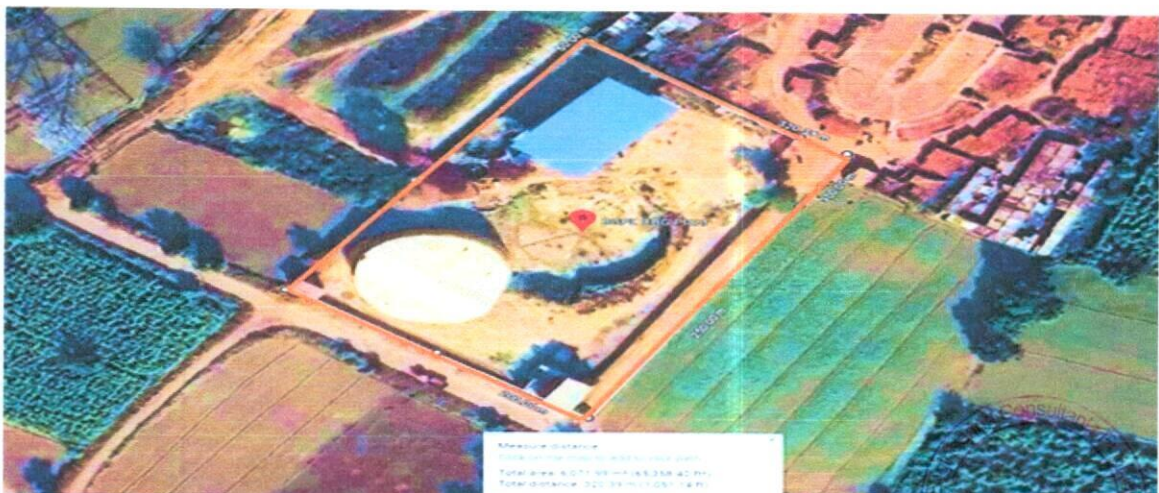
a) GOOGLE MAP LOCATION:

The Bio-CNG plant is proposed to be set up at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh - 201206 with GPS coordinates 28°46'08.8" North and 77°26'20.3" East as per the Google map attached below:



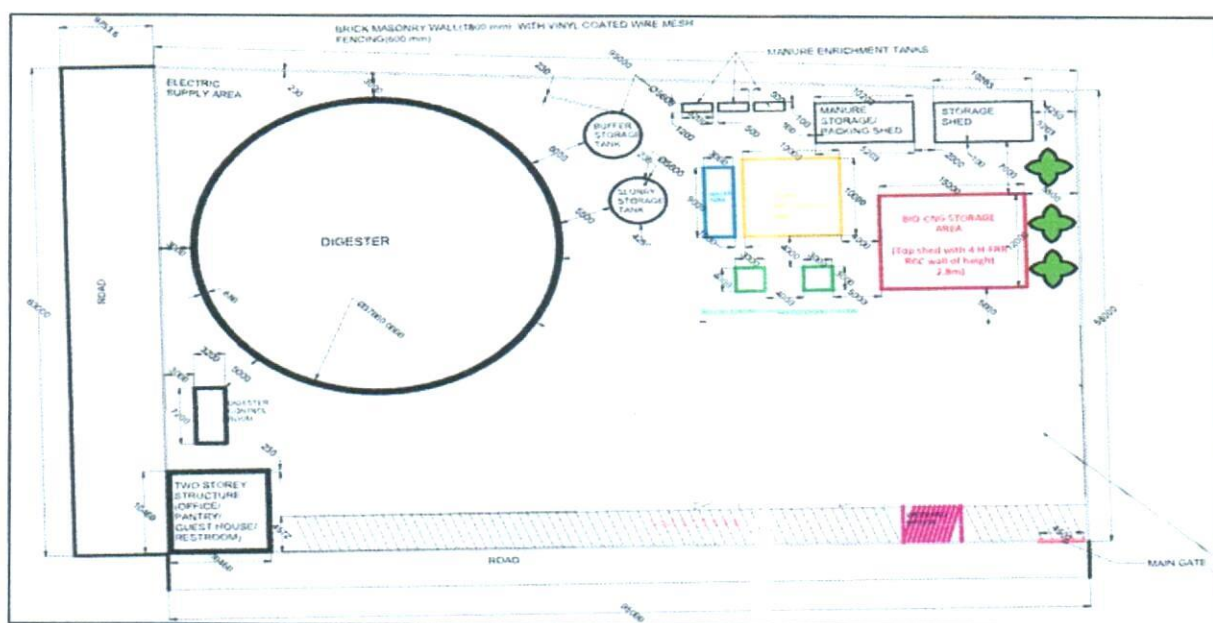
b) GOOGLE MAP LAYOUT:

Demarcation of the land with approximate measurement on the Google map is attached in the below picture:



3. LAYOUT PLAN:

As per the data/information provided by the client/Company, Proposed layout was prepared by M/s Sobti Engineering Works Private Ltd. and under construction plant is sold out to M/s ZVRPL. New promoters has decided to go with the same site plan as it was partially constructed and PESO & CTE approval were taken by ex-owner of the plant based this layout plan. NOC from the Gram Panchayat has already been taken by the M/s Sobti Engineering Pvt Ltd from *Gram Panchayat - Bhadauli, Development Block – Bhadauli, District Gaziabaad* which needs to be change in the name of M/s ZVRPL. Proposed layout plan has been attached below for reference:



4. LAND AND BUILDING & CIVIL WORKS DETAILS:

As per the agreement to sell dated 16th May 2024, this partially constructed CBG facility has been purchased by the company from M/s Sobti Engineering Works Pvt. Ltd with the land measuring 6070 Sq. Mt. at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh – 201206.

During the site visit dated 25th Sep 20224, we found that the subjected freehold property is an Industrial Biogas manufacturing Plant over a land of area 6070 Sq. Mt. situated at aforesaid address. Property is demarcated with permanent boundary wall. However, demarcated land area works out to only ~ 5645 Sq. Mt. On enquiry it was told that in order to make the entry gate on the North-East side of the property, owner had left ~12 ft wide space for making ~320 feet road.

This area works out to ~ 425 Sq. Mt. Since as per the sale deed and also as per the CLU total land area is 6070 Sq. Mt., therefore same is considered for this TEV study. The subject property comprises of G+1 RCC structure and Tin shed having built-up area 6329 Sq. ft. and a Digester. Approved map is not provided to us so the built-up area is considered on the basis of site measurement and proposed map shared by the client prepared by the ex-owner of the plant M/s Sobti Engineering Works Pvt. Ltd.

As per the land deed Ref: G-11849 Dated: 10-10-2019 shared by the client, land is in the name of M/s Sobti Engineering Works Pvt. Ltd at present for which CLU was obtained on 11th Aug 2020 from sub-divisional magistrate, Modinagar. Ownership of the land needs to be transfer in the name of M/s ZAK Ventures Renewable Pvt Ltd. We recommend the bank to suggest the client for submit the revised ownership details of the land as and when it's required before disbursement.

The said CBG plant is spread over an area of 6070 Sq. Mt. for which M/s ZAK Ventures Pvt Ltd has paid ~INR 5.35 Crore to seller, including land with 7% registration charges, building & civil works, boundary wall and partially constructed digester as informed by client, however any documentary evidence/bill/invoice/bank receipt etc. has not been provided to us by the client against the paid amount claimed by the promoters. We recommend the bank to suggest the client to submit the supporting evidence of paid amount.

As per valuation of the property done by R K Associates dated 01.10.2024 (Ref: VIS (2024-25)-PL398-348-472), fair market value of the land, building & civil works, boundary wall and RCC digester is shown in the below table:

Valuation Of Land			
S. No.	Particulars	Govt. Circle/ Guideline Value	Indicative & Estimated Prospective Fair Market Value
a.	Prevailing Rate range	As mentioned in table below	Rs. 6000-7000/- per Sq. Mt.
b.	Rate adopted considering all characteristics of the property	As mentioned in table below	Rs. 6,500/ per Sq. Mt.
c.	Total Land Area considered (documents vs site survey whichever is less)	6070 Sq. Mt.	6070 Sq. Mt.

d.	Total Value of land (A)	As mentioned in table below	6070 Sq. Mt. x Rs. 6,500/- per Sq. Mt.
		Rs. 1,86,58,500/-	Rs. 3,94,55,000 /-

S. No.	Govt. Guideline for large land parcel (Sq. Mt.)	Govt. Rate (per Sq. Mt.)	Land Area (Sq. Mt.)	Guideline Value (INR)
1	0-1000	3500	1000	35,00,000
2	1001-2500	3150	1500	47,25,000
3	2501-5000	2975	2500	74,37,500
4	5001-10000	2800	1070	29,96,000
Total			6070	1,86,58,500

*As per Govt. Guideline the land rates varies as per the size of the property.

Building and Civil Works												
Sr. No.	Block Name	Floor	Height (in ft.)	Type of Structure	Built-up Area (in Sq. Mt.)	Built-up area (in Sq. ft.)	Year of Construction	Total Economical Life (In year)	Plinth Area Rate (INR per Sq. feet)	Gross Replacement value (INR)	Fair Market Value (INR)	Govt. Guideline Value
1	House	G.F.	10 ft.	RCC with	109.0	1173	2022	60	1,200	14,07,918	13,65,681	15,26,000
		F.F.	10 ft.	Brick work	39.0	420	2022	60	1,100	4,61,771	4,47,918	5,46,000
2	Tin Shed	G.F.	15 ft.	M.S. Structure & G.I shed	440.0	4736	2022	30	500	23,68,058	22,25,975	44,00,000
Total					588	6329				42,37,747	40,39,573	64,72,000

Remarks:

1. All the details pertaining to the building area statement such as area, floor, etc. has been taken as per the information provided to us.
2. The maintenance of the building was average as per site survey observation from external.
3. Age of construction taken as per the information provided to us during survey.
4. The Valuation is done by considering the depreciated replacement cost and while calculating D.R.C. 10% salvage value is considered.

Sources: FILE NO.: VIS (2024-25)-PL398-348-472 Valuation done by RKA

Valuation Of Additional Aesthetic/ Interior Works In The Property			
S. No.	Particulars	Specifications	Depreciated Replacement Value
a.	Add extra for Architectural aesthetic developments, improvements (add lump sum cost)	----	-----

b.	Add extra for fittings & fixtures (Doors, windows, wood work, cupboards, modular kitchen, electrical/ sanitary fittings)	----	----
c.	Add extra for services (Water, Electricity, Sewerage, Main gate, Boundary, Lift, Auxiliary power, AC, HVAC, Firefighting etc.)	----	Rs. 17,00,000/- (Boundary Wall) Rs. 1,52,00,000/- (Digester)
d.	Add extra for internal & external development (Internal roads, Landscaping, Pavements, Street lights, Green area development, External area landscaping, Land development, Approach road, etc.)	---	---
e.	Depreciated Replacement Value (B)	----	Rs. 1,69,00,000/- (Approx.)

Consolidated Valuation Assessment Of The Asset			
S. No.	Particulars	Govt. Circle/ Guideline Value	Indicative & Estimated Prospective Fair Market Value
1.	Land Value (A)	Rs. 1,86,58,500/-	Rs. 3,94,55,000 /-
2.	Total Built-Up Unit Value (B)	Rs. 64,72,000 /-	Rs. 40,39,573 /-
3.	Additional Aesthetic Works Value (C)	---	Rs. 1,69,00,000/-
4.	Total Add (A+B+C)	Rs. 2,51,30,500 /-	Rs. 6,03,94,573 /-
5.	Total Indicative & Estimated Prospective Fair Market Value	---	Rs. 6,03,94,573 /-
6.	Rounded Off	---	Rs. 6,04,00,000 /-

Thus the cost of Land including boundary wall & land development work, Building & Civil works and partially constructed RCC digester considered by the client as INR 5.35 cr. seems to be reasonable and found in permissible range.

5. SITE PICTURES:

Site pictures were captured during the site visit on 8th May 2024, for reference few of the pictures are attached below:











6. PLANT & MACHINERY/ EQUIPMENTS DETAILS:

Promoters of M/s ZVRPL has decided to procure & install the required plant and machinery on their own as the company is having in-house technical team. Detailed bifurcation of the proposed Plant & Machinery has been shown in the below table along with the estimated cost:

S. No.	Name Of equipment	Cost of Equipment as per the Quotation in Cr.
1	Digester for generating 6250 M3 of gas	1.50
2	Partial PSA Supply, 2 Tower PSA equipment	0.80
3	Balloon, Agitators, SLS and Other ancillaries	2.44
4	Compressor & Cascade and Pipeline for Grid Injection	3.98
5	SCADA, Electrical, Control Panels and DG Set	1.19
	Total	INR 9.91 Crore

Source: Data/information provided by the client.

Thus, as per shared quotations by the client, the estimated cost for plant & machinery will be ~INR 9.91 Crore including 18% applicable GST. ~60% of Total Project Cost is the cost Plant & Machinery.

The estimated cost of the Plant & Machinery has been provided to us by the client as per quotations received by them from various vendors/suppliers. However, as a TEV consultant, the cost of major plant & machinery has been verified by us independently, which we found

reasonable & in the permissible range although the cost may change as per specifications & brand.

Note: It is to be noted here that the cost estimation done by us is just a general assessment for TEV purpose. However, detailed cost vetting is out of scope of this TEV report.

7. MISCELLANEOUS ASSETS:

Miscellaneous assets includes office equipment such as laptop, printer, furniture & fixtures and vehicles. The estimated cost of miscellaneous assets is considered as INR 0.15 Crore including GST. However, no any quotations/invoice/bills are provided by the client against the estimated cost. As per general industry practice, we found that the costs are in the line with prevailing market standard.

8. UTILITIES: Details of Water, Electricity and other utilities are describes as below:

a. WATER:

As per the data/information provided by the client, the partially constructed plant has the water bore well at present. ~20-30 cubic Mt. water will required on daily basis for proposed plant after first supercharge of the plant and water requirement will be fulfilled by bore well. Company will apply for "No Objection Certificate" for groundwater extraction from concerned department (Namami Gange & Rural Water supply department), Ministry of Jal Shakti, Government of Uttara Pradesh, after approval the Company can extract 10 kl water per day.

b. ELECTRICITY:

As per the data/information provided to us by the client regarding Parasitic Consumption of Power (Tentative), proposed Bio CBG plant will required a connected load of 350 KVA. ~120 Kwh is the running load i.e. Number of unit the plant is expected to consume is ~2500 Kwh/day.

The partially constructed purchased plant is having the electricity connection from the electricity department on the previous owner's name once the land papers transfer in the name of ZAK Venture Renewable Pvt Ltd, Company will get it transferred in its name. Component wise estimation of the Auxiliary power consumption is shown in the below table:

Sources: Data/information shared 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 capacity of 6,250 M3/Day to generate the 2,500 kg/day bio CNG as per LOI with OMC along with 15 Ton/Day of solid organic fertilizer as illustrated in the below table:

Capacity of the proposed Bio-CNG plant	
Particular	Capacity
Raw Bio Gas Capacity	6,250 Cubic Mt.
Bio-CNG Plant Capacity	2,574 kg/Day
Leakage factor @2.90%	~74.60 kg/day
Net Output	2,500 Kg/day
Organic Fertilizer Capacity	15,000 kg/Day

Source: Data/information provided by the client.

2. PRODUCTION PROCESS OF BIO CNG (CBG):

OVERVIEW:

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 thermophilic 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:

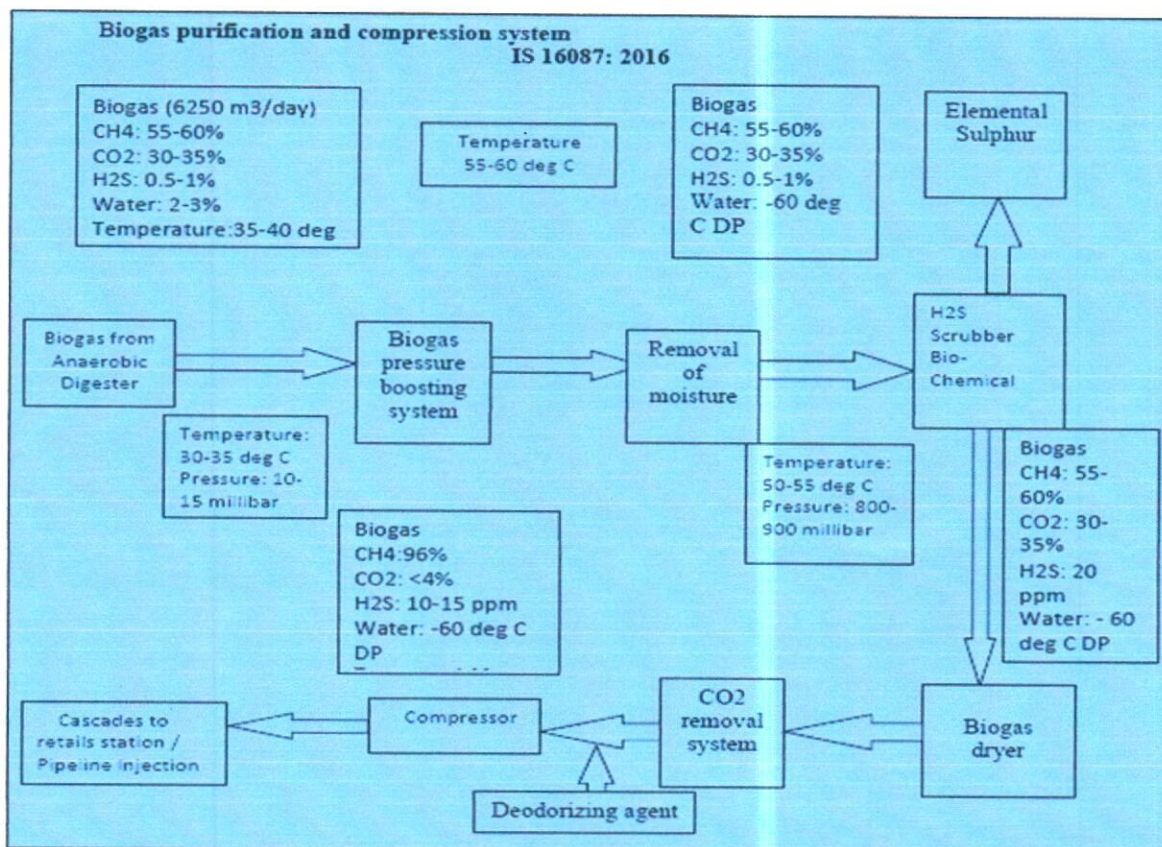
Particular	Concentration
Methane (CH ₄)	50-60 %
Carbon dioxide (CO ₂)	36-40 %
Water vapour (H ₂ O) saturated mass	3- 4 %
Hydrogen sulphide (H ₂ S)	50-2500 PPM
Ammonia (NH ₃)	0-300 PPM
Non-gaseous particulates and oil	Low concentration

f) BIOGAS UPGRADATION:

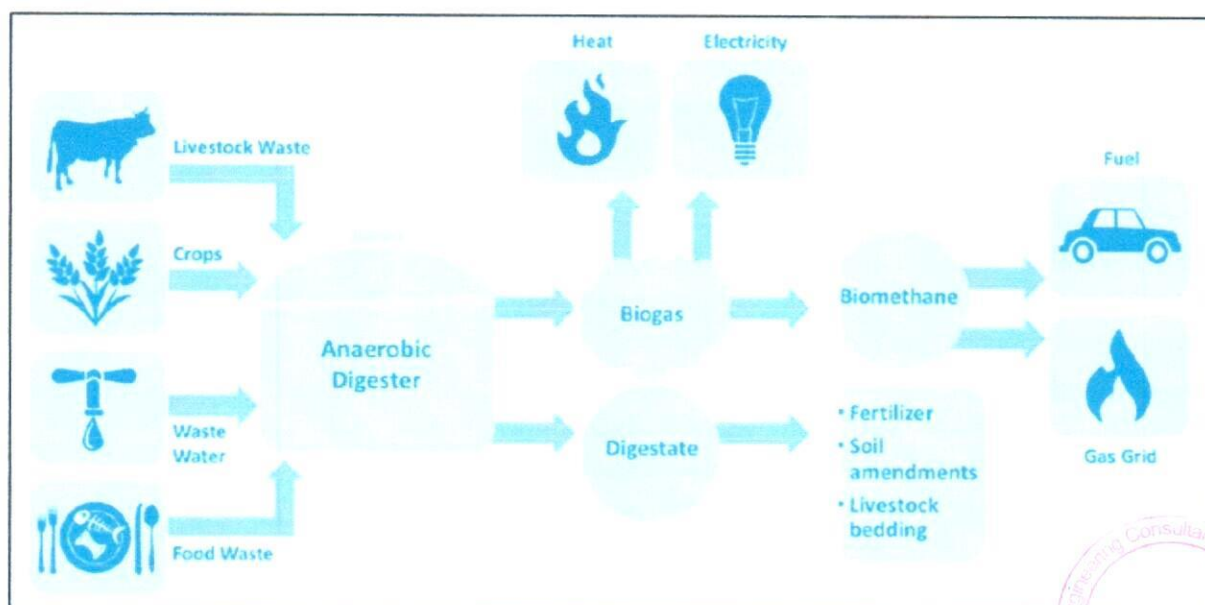
Biogas upgradation is the process of removing impurities like H₂S, Moisture and Co₂. The catalytic removal process is being used to remove H₂S. The moisture is being removed in two steps, first by the chilling process and second by the desiccant adsorption process. The removal of CO₂ is being done by four tower VPSA system, it's a versatile and a proven technology for gas separation, in this system the company will be using four steps for removing CO₂, as Adsorption, desorption (evacuation by vacuum), purging and pressurization.

The process of Co₂ adsorption on solid surface of porous material called molecular sieve at pressure of 0.7 bra G by Roots type gas Blower, after its saturation this tower will come in desorption in this step the vacuum shall be taken up to minus 0.8 bar by using water ring type vacuum pump, after the completion of the step tower will come in next step call purging during purging the product gas will be purged and final step is depressurization then the tower will be depressurize by equalize with the tower in

process and tower purged and then pressurize with product gas. This process is the cyclic and repeated in cycle of 5 minutes. The system is controlled by programmable logical control system through a control panel.



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



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

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

Mechanical Equipment		
S. No.	Particular	Technical specification and Make
1.	Agitators	Agitator Make: Cri-man as per quotation of Tectiko Innovation & Equipment Pvt Ltd Specification: 18.5 KW Submersible Agitator with wall bracket, lowering and lifting device, with 9.5 m SS square pipe.
2.	VPSA	Two Tower VPSA System Air Shuddhi – 300 m3 / Hr
3.	Solid Liquid Separator	Make: WAM as per quotation of Magnite Business Corporation Specification: Solid Liquid Separator, 15 m3/hr
4.	DG Set	Make: Sterling Generator as per quotation of Tectiko Innovation & Equipment Pvt Ltd Specification: STERLING GENERATOR's MAKE 250 KVA, 415V, RADIATOR COOLED, SILENT TYPE, CPCB-IV STERLING MAKE D.G. SET consisting of BAUDOUIN ENGINE coupled with 250 KVA, 415V, 50 Hz, 1500rpm CG/LS/SF MAKE ALTERNATOR mounted on a common base plate along with other standard accessories i.e. AVM pads, 1st fill of lube oil residential silencer, batteries with leads, inbuilt capacity fuel tank, Standard SG420 Controller without breaker etc.
5.	Compressor	Make: Sanmish Energies Pvt Ltd Specification: Compressor Model CST223.18 GP Number of stages 5 Cylinder arrangement T Cylinder Lubrication Oil Lubricated Type of Oil Mineral Oil. Gas to handle Biogas* Suction Pressure range 1.05 Bara Suction Temperature range 35 °C Humidity 0 % Ambient Temperature range 10 to 40 °C Discharge temperature Ambient + 15 °C Noise Level without canopy at free field condition 98 db (A), +/- 3dBA measured at one (1) meter distance *CH4 96%, CO2 4%, H2S<10ppm, gas dry to (-)60 ADP temperature. Moisture in presence of H2S and CO2 forms corrosive compound detrimental to compressor. Compressor speed

		rpm 1045 Motor rating KW 132 Suct. Pr. barA 1.05 Capacity Nm3/hr 395 251 barA 117
6.	Cascade System	<p>Specification: Cascades with Type-1 4500 Ltr Water Capacity Cascade.</p> <p>4500 Ltr Water Capacity Single Bank Cascade. Cylinders manufactured and tested as per standard and approved by accredited third party agency and PESO</p> <ul style="list-style-type: none"> • Pressure manifold Fittings and Valves: SS316 Swagelok/Parker/Hylok. • Pressure manifold Tubing's: SS316 Sandvik/Ratnamani/Jindal • Vent manifold Fittings: SS304/Brass/Copper Indigenous • Vent Manifold Tubing's: SS304/Brass/Copper Indigenous • CNG Cylinder Valves: PESO Approved: Tekno / Batra / Vanaz valves • The above cascade will be provided fitted along with suitable MCV
7.	Control & Electrical Work	<p>Hardware & Sensors- (Flow Meters, Solenoid Valves, Sensors & Accessories)</p> <p>Electrical & Control Panels (PLC, VFD, HMI, SCADA)</p> <p>Field cable for Motor's, Sensor's, Control Valve, Field Instruments or any other cables required as per the site requirement</p> <p>All the cabling work, trenching, and interconnection between plant equipment's</p> <p>PLC Programming, SCADA Designing, Software Integration, Data management, web Application, Report Generation, Alarm Generation</p> <p>Note: For more details refer the table attached below.</p>
8.	Biogas Holder System (Lucky Tech)	<p>Offer from: LUCKY-TECH Membranes Pvt. Ltd.</p> <p>BIOGAS Balloons Engineered & Manufactured in SIOEN Belgium make BIOGAS SPECIFICPVC Coated Fabrics</p>

Control & Electrical Work At 2.5 TPD CBG Plant

TECHNO-ECONOMIC VIABILITY REPORT

M/S ZAK VENTURES RENEWABLE PRIVATE LTD

S. No	Product	Specification	Quantity
Feeding Tank:			
1	VFD (For Agitators)	10HP	1
2	Sensor to check Total Solid content	Water Density	1
Raw Material Feeding			
1	VFD(Feeding Pump)	20HP	1
2	Liquid Flow Meter(0-75 m3/Hr)	8 inch	1
Digester 1			
1	VFD (For Agitators)	20HP	4
2	ph Level Sensor	(0-100%)	2
3	Temperature Sensor	(20 - 40 Deg)	2
4	Level Sensor	0-10 Meter	2
5	Pressure Sensor	(0-1 Bar)	2
6	Flow Meter(0-75 m3/Hr)	8 inch	2
7	Motorised Control Valve	8 inch	2
8	VFD (For Blower)	0.5 HP	2
Slurry output			
1	Liquid Flow Meter(0-75 m3/Hr)	8 inch	2
2	Motorised Control Valve	8 inch	2
Raw Biogas			
1	Gas Flow Meter(0-750 m3/Hr)	4 inch	2
2	Motorised Control Valve	8 inch	2
PSA to Balloon			
1	Gas Flow Meter(0-750 m3/Hr)	4 inch	1
2	Motorised Control Valve	8 inch	1
3	Gas Pressure Sensor	(0-1 Bar)	1
Balloon to compressor			
1	Gas Pressure Sensor	(0-0.5 Bar)	1
2	VFD (For Blower)	0.5 HP	1
Control Panel			
1	PLC S7-1500	Siemens	1
2	DI CARD (16 DI)	Siemens	3
3	DO CARD (16 DO)	Siemens	3
4	AI CARD (4 CH)	Siemens	6
5	Modbus Card	Siemens	1
6	HMI (10 Inch) Touch	RENU	1
7	SCADA	TESLA	1
8	Electrical Panel & Accessories	Standard	Lump sump
9	Panel Accessories	Standard	Lump Sump
10	Field Cable for motor's, sensor's, valve's, field instruments		
Software			

1	Web Application	ECSPL	1
2	mySQL DATABASE	ECSPL	1
3	User Management	ECSPL	1
4	Report Generation	ECSPL	1
5	Alarm Generation	ECSPL	1

5. TECHNOLOGY USED:

a) TECHNOLOGY SUPPLIER, EPC CONTRACTOR:

As per the data/information provided by the client, Company has purchased this under construction plant from M/s Sobti Engineering Works Pvt Ltd. New Owner/Promoter of the project M/s Zak Ventures Renewable Pvt Ltd are having expertise in the field of setting up a of CBG plant by deploying their in-house well experienced technical team of consultants. On request of RKA, profile of key technical professionals associated with ZAK are as follows:

S. No.	Name	Profile Description
1.	Mr. Babar Shah	<p>As informed by client, An Engineering graduate with Master's in Marketing. He is 38 years old and has over 15 years of experience. He is instrumental in techno commercial solutions for gas based power plants (Stand-by, Captive & independent) and Waste to energy solution on various technical and commercial models. Responsible to accrue and expand business by providing solutions on Renewable Energy and Natural Gas sector.</p> <p>He is having specialization in Business Management, Operation management and execution of Techno-Commercial Operations. He has worked with many established multinational companies like QUIPPPO ENERGY, CUMMINS, and CLARKE ENERGY in the key role position.</p> <p>Currently associated with ZAK Venture Pvt Ltd as Director with primary responsibility of managing the existing business operations and bringing new business to the companies. All the projects are mainly in the waste to energy, Gas based power, Compress Biogas Plants and Natural Gas Pipeline sectors.</p> <p>Few Successfully executed project details:</p> <ul style="list-style-type: none"> Waste To Biogas Project ~ 2mw Electricity @ Rithala

		<p>Sewage Treatment Plant, Delhi Jal Board. Project Cost = 30 Crores.</p> <ul style="list-style-type: none"> Industrial Waste (Maize Processing Plant ETP) To Biogas @ RR Foods, Lucknow. Project Cost = 15 Crores Animal / Industrial Waste to Biogas @ Patiala, Punjab. Project Cost= 10.5 Crores. Press Mud to Compress Biogas Project @ Modinagar, Uttar Pradesh Project Cost= 8 Crores. 8mw Natural Gas Based Cogeneration Project @ Honda Cars India Limited, Greater Noida. Overall Project Cost = 40 Crores. 1.3 Mw Gas Based Power Plant At New Holland Tractor For Their Manufacturing Unit In Greater Noida. Project Cost 3 Crore. Various Project Of Gas Genset Rating From 0.7mw To 8mw Installed At Locations Across India. Project Cost 50 Crores
2.	Mr. Rakshit Naudiyal	<p>He has done M. Tech. in Mechanical Engineering. A high-caliber professional with master's in mechanical engineering and extensive experience in the Oil & Gas, Renewable Energy Sector.</p> <p>Key Skills: Project Management Strategic Planning Design analysis Installation & Commissioning Operation & Maintenance Process Enhancements Liaison & Coordination Cost analysis Inspection Waste to Energy Bio-CNG R&D Anaerobic digestion Biomethanation </p> <p>Project Executed:</p> <ul style="list-style-type: none"> 150 TPD Pressmud and Cattle based Compressed Biogas Plant at Karnal, Haryana. 150 TPD Pressmud and Cattle based Compressed Biogas Plant at Sonipat, Haryana. I&C of Horizontal Ladle Preheater, Client Name: SMS India Limited. I&C of 30 TPH Burner Management System for Boiler

		<p>Operation, Client Name: Pt. Rajawali Putra Merpi.</p> <ul style="list-style-type: none"> • I&C of Vertical Ladle Preheater, Client Name: Rungta Mines Limited, Jharkhand. • I&C of Horizontal Ladle Preheater, Client Name: Tata Bhushan steel Ltd.
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However complete profile of the technical team has not been shared with us by the client and we recommend the bank to suggest the client to submit required information in this regard before disbursement. Also bank may appoint a professional for due diligence of the team of technical experts of ZAK Ventures.

As per the agreement to sell shared by the Company, The partially constructed plant has been purchased by the company along with land, 15-20% constructed digester along with few other equipment and Machinery procured by ex-owner of the project.

M/s ZVPL (Promoters) has decided to complete the RCC digester and procurement of all the required Plant and Machinery would be done on their own after comparing all the vendor's reasonable quotations. Thus the project will be implemented by owners itself and no EPC contractor appointment will be required.

b) PROPOSED TECHNOLOGY:

BIO-METHANATION TECHNOLOGY:

- The **CSTR Mesophilic bio-methanation technology** is proposed to be supplied by Air Sudhi.
- The manufacturing process uses **mesophilic CSTR bio-methanation** for ensuring high efficiency in converting substrates to biogas, low environmental footprint and low capital cost of the plant and machinery, and 100% availability of plant independent of local climate and weather conditions.
- The plant has a low physical foot print as the hydraulic residence time of the mesophilic plant is just 28-30 days.
- The plant operates 24 X 7 throughout the year as the temperature is maintained at 36-40°C, and hence has constant output of biogas independent of the external

temperature and climatic conditions. This ensures high plant availability throughout the year.

BIO-GAS UP-GRADATION TECHNOLOGY:

- The biogas so generated is separated into bio methane and CO₂ using PSA system that recover approximately over 96-98% of the methane from biogas at methane purity 95-96%.
- The separated bio methane is compressed to 250 bar g using high efficiency compressor and filled in cascades of standard cylinders of 4500 Litre of water capacity. The gas is directly supplied to IOCL CNG Pump Outlets/ consumers as automobile fuel at a retail outlet in the market areas, using state of art gas dispensers. The separated CO₂ is released to the atmosphere.
- Most of the water used for the process is recovered and recycled from the biogas slurry, to cut down the requirement of make-up water for process requirement, thus reducing the water footprint of the project.
- All the macro and micro nutrients in the feedstock are recovered in the form of solid and liquid fertilizers, with ultra-filtration and reverse osmosis process plants, thus forming a virtuous closed loop.

PROCESS TECHNOLOGY:

- There are three temperature ranges in which bio methanation takes place mesophilic (35-38°C) and thermophilic (40 - 55°C) in this project about 50 MT/ day of cattle dung will be co-digested with about 35 MT/ day of Napier Grass, which may be arranged by company from FPO and own cultivation.
- The pH and C: N ratios will be adjusted and the entire hydrolyser and digester are thermally insulated and heated to 35-38°C with a heat pump to provide the required temperature for thermophilic bacteria to thrive and maximize biogas output.
- The present project proposes to employ two stage thermophilic processes using a continuous stirred tank reactor configuration to optimize plant size and conversion efficiency.

6. LATEST TECHNOLOGY/TECHNOLOGICAL ASSESSMENT:



Anaerobic digester technology has come up with several innovations in the last few years which assists project developers to implement a scalable, viable bio-CNG plant with improved process efficiency at a lesser cost. Now a days several conventional anaerobic digester technologies exist such as Continuous stirred tank reactor (CSTR), KVIC models and more, recent innovations in technologies such as plug and play digester models ensure improved efficiency and automation of the process compared to conventional technologies.

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 ZAK Ventures Renewable Pvt Ltd is using the appropriate Mesophilic (25-40 Degree Celsius) CSTR 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.

7. TESTING STANDARDS FOR PRODUCTION:

CBG or Compressed Bio Gas consist of mainly methane (more than 90%) and other gasses like carbon dioxide (less than 4%), etc. CBG is produced by anaerobic digestion of biomass and waste sources like agricultural residue, cattle dung, sugarcane press mud, municipal solid waste, sewage treatment plant waste, etc.

This Biogas can be purified to remove hydrogen sulphide (H₂S), carbon dioxide (CO₂), water vapor and when this purified biogas (methane content more than 90%) is compressed to maximum 250 bar and filled up in cascades (group of high pressure cylindrical vessels) it is called Compressed Bio Gas or CBG.

CBG has properties almost similar to CNG and hence a vehicle running on CNG can straightway be filled with CBG without any modification in the vehicle. Ministry of Road

Transport and Highways, Government of India, vide Gazette Notification no. 395 dated 16.6.2015 has permitted usage of CBG for motor vehicles as an alternate of CNG. BIS has issued IS 16087 2016 standards on CBG which is similar to BIS specifications IS 15958:2012 for CNG.

The deodorizing agent will be inducted into the stream of purified biogas coming out of CO2 removal system. The safety system will shut down the CBG plant in case of emergency with safety. Thus, Ring type fire safety system will be installed along with localized fire safety system. Since biogas is inflammable, the CBG plant conforms to CE/ATEX standards of safety. Redundancy is maintained for mechanical equipment. All the motors will be electric spark proof. They will be with VFD. For correction of power factor, Power factor correction is devised considering highly inductive load.

8. MANPOWER:

As per information shared by the client/company, a proper ratio between the administrative, managerial, supervisory and shop floor staff has been maintained with a view to affording proper industrial and professional management at various levels in estimating the manpower requirement. The basic structure of the manpower will require the following kind of resources to operate the plant 24*7 for 350 days a year:

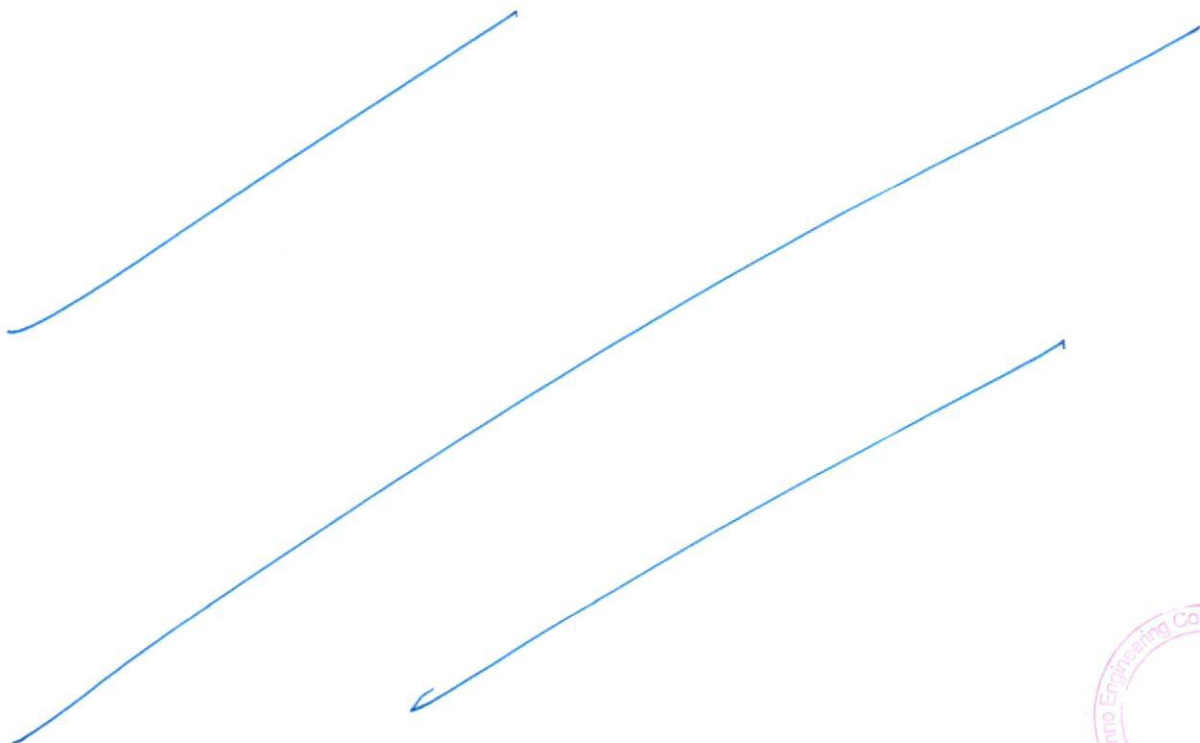
Proposed manpower details along with Cost (INR)		
Workers on Wages		
Category	Number	Average Monthly Salary
Skilled Workers	2	25,000
Semi-Skilled Workers	2	20,000
Un-Skilled Worker	2	20,000
Sub Total	6	
Factory Supervision		
Category	Number	Average Monthly Salary
Shift Supervisor	1	45,000
Field Officer	1	35,000
Store In-Charge	1	22,000
Store Assistant	1	20,000
Chemist	1	18,500
Driver for Transportation of Bio-CNG	2	15,000
Sub Total	7	

Office Staff		
Category	Number	Average Monthly Salary
General Manager	1	80,000
Accounts Manager	1	50,000
Accounts Assistant	1	35,000
Office Assistant -Marketing	1	25,000
Office boy & Security	2	12,000
Sub Total	6	
Grand Total	19	

Source: Data/information provided by the client

Company has proposed to deploy 19 human resources initially as shown in the above table, which comes out with ~8 workers per ton for the proposed Bio-CNG generating plant which is in permissible range as per the standard benchmark of the industry considering the operational scope & scale of the proposed plant. This is a tentative figure provided by the client, Estimated manpower may change as per the actual requirement post C.O.D.

(Ref: <https://pib.gov.in/PressReleasePage.aspx?PRID=1868887>) The Sangrur CBG Plant shall provide direct employment to 390 and indirect employment to 585 people. This is a 33TPD capacity plant, thus it comes out with ~12 (*390/33) workers per ton.



(Handwritten signature and circular stamp of R.K. Associates)

PART F

PRODUCT PROFILE

1. INTRODUCTION:

BG 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 2,500 Kg/ day of Bio-CNG as per LOI with OMC which has a gross calorific value of 12,500 Kcal/Kg. 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- 96% 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	Test Method
CH ₄ (Percentage)	95-96 %	IS-5130 (Part3)
CO ₂ + N ₂ + O ₂ (Percentage)	4-5 %	IS-15130 (Part3)
Only CO ₂	< 4 %	IS-15130 (Part3)
H ₂ S (Mg/M ³)	5 (Mg/M ³)	ISO- 6326-3
Moisture (Mg/M ³)	5 (Mg/M ³)	IS-15641 (Part2)

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

b) ORGANIC FERTILIZER:

The plant has a capacity to produce 15,000 Kg/ day of solid organic fertilizers. The material drawn from the digester is called sludge, or effluent., which is rich in nutrients (ammonia, phosphorus, potassium, and more than a dozen trace elements) and is an excellent soil conditioner.

Quality of Fermented 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 typical elemental composition of the organic manure and biogas obtained at two of the operating plants based on BARC technology is given below:

Elemental Composition Of Organic Manure	
Calcium	0.39-0.65 %
Iron	0.18-0.32 %
Magnesium	0.032-0.01 %
Manganese	0.0059-0.008 %
Nitrogen	2.6-3.5 %
Phosphorous	0.8-0.9 %
Zinc	0.007-0.009 %
Potassium	0.8-0.95 %

In other words, one ton of slurry 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 nutrient composition of slurry manure is shown in the below table:

Nutrient Composition Of Slurry Manure		
Sr. No.	Ingredient	Value
1	Total Nitrogen (%)	1.40 – 1.84
2	Total Phosphorous (%)	1.10 – 1.72
3	Total Potash (%)	0.84 – 1.34
4	Organic Carbon (%)	35.0 – 38.4
5	Zinc (mg/kg)	103 – 116
6	Copper (mg/kg)	51 – 68
7	Manganese (mg/kg)	231 – 295
8	Iron (mg/kg)	3200 – 3600
9	Carbon / Nitrogen ratio	10 – 15
10	Organic Matter	65%

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:

As per the data/information provided by the client, Promoters of the Company M/s Zak Ventures Pvt Ltd has already signed a LOI with IndraPrashta Gas Ltd on 4th December 2023. (Ref No. - IGL/SATAT/07/19A) for which bank guarantee of INR 5.00 lakhs has been paid by the company. However commercial agreement between IGL & company will be signed before C.O.D. It is to be noted here that the ZVPL has transferred the ownership & operational responsibility of this plant to its subsidiary Company M/s Zak Ventures Renewable Pvt Limited by signing an agreement of transfer of asset dated 14th October 2024. Accordingly Company will sign a fresh LOI with OMC after the land ownership is changed.

As informed by the client, company has planned to sell its Bio CNG at a Retail Outlets of IGL at Ghaziabad in Uttar Pradesh. The current retail selling price of CNG at OMC outlets in Ghaziabad is around INR 79.70 per kg in October, 2024. (<https://www.goodreturns.in/cng-price-in-ghaziabad.html>). The procurement price of Bio-CNG at IGL as per the SATAT Scheme falls under the slab of INR 59.06 per kg without GST. (Ref: CO/AE&SD/01 Dated: 14.08.2023). (<https://satat.co.in/satat/assets/download/CBG%20Pricing%20Circular%20-%20Stakeholders.pdf>). "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 यादव जंग मार्ग, बान्द्रा (ई), मुंबई - 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, Fermented organic fertilizer would be sold out to the farmers directly @ INR 2.75 per kg in the exchange of Cow dung. It is to be noted here that the client has not provided any futuristic plan or agreement with farmer/FPO to us, hence we recommend the bank to suggest the client to submit a plan with risk free avenue of selling out the produced fertilizer before disbursement.

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.

Additionally, in a significant move towards promoting sustainable agriculture, 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>).

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 62.86/kg without GST. The selling rate of fermented organic solid and liquid fertilizers is assumed as INR 6.00 per kg.

4. MARKETING, SELLING & DISTRIBUTION PLAN:

a) BIO CNG:

The Bio-CNG produced has to be sold to IndraPrashta Gas Ltd for which the company have already signed a LOI on 4th December 2023. (Ref No. - IGL/SATAT/07/19A). Company need to obtain a supplemental LOI with the changed name of M/s Zak Ventures Renewable Pvt Ltd.

b) ORGANIC FERTILIZER:

As informed by client, Fermented organic fertilizer would be sold out to the farmers directly @ INR 2.75 per kg in the exchange of Cow dung. Other than this arrangement, Government of U.P. issued the government order number 43/2022/1101/87-8(1) AESD/2022 dated 3rd October 2022 and making the mandatory provision for sale of Bio fertilizer on Government Licensed fertilizers shop in the state under the clause of 2.4 of UP Bio Energy Policy 2022.

Additionally, in a significant move towards promoting sustainable agriculture, 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>).

The government aims to bolster the production and use of organic fertilizers like FOM; liquid fermented organic manure (LFOM), and enriched phosphate rich organic manure (PROM). These fertilizers emerge as by-products from biogas (BG) and compressed biogas (CBG) plants.

It is to be noted here that the client has not provided any futuristic plan or agreement with farmer/FPO to us, hence we recommend the bank to suggest the client to submit a plan of a risk free avenue of selling out the produced fermented organic fertilizer before disbursement.



INDRAPRASTHA GAS LIMITED

(A Joint Venture of GAIL, BPCL & Govt. of NCT Delhi)

Ref: IGL/SATAT/07/19A

Date: 04.12.2023

M/s ZAK VENTURES PVT LTD
OFFICE NO. 2502, 5TH FLOOR, TOWER NO.2,
EXPRESS TRADE TOWER, SECTOR 132, NOIDA, UTTAR PRADESH-201301

Subject: Letter of Intent (LOI) for supply of CBG to IGL under CBG-CGD
Synchronization Scheme

Notice Inviting Expression of Interest ref. :	IGL_CBG07
EOI released on:	21.11.2022

Referring to documents submitted in the EOI (Expression of Interest) and/or correspondences exchanged with IGL and your willingness to provide ~5 TPD of Compressed Bio Gas (CBG) to IGL from CBG plant proposed to be located at (Coordinates: 28.769487, 77.439049) Khasra No. 946, Village Bhadoli, Ghaziabad, Uttar Pradesh-201206 for off-take through IGL Infrastructure.

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 M3 Biogas		
Sr. 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	Napier Grass	50-55
2	Poultry Droppings	45-50
3	Food Waste	85-90
4	Sugarcane Press mud	60-70
5	Cow Dung	150-160

Combination of any of these mentioned above can also work in proportionate quantity. However, as per feed stock analysis the proposed bio-CNG plant will be using the following Combination of Raw Materials, while it should be noted that the feed stock quantity may vary 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	Napier Grass	Between 35-40
2	Cow Dung	Between 50-55

Note: As informed by the client, the proposed plant will be designed for mix feed. Mix of Napier Grass and Cow Dung will be used as major feed stock and Sugarcane Pressmud is considered as backup Raw material source.

2. NAPIER GRASS:

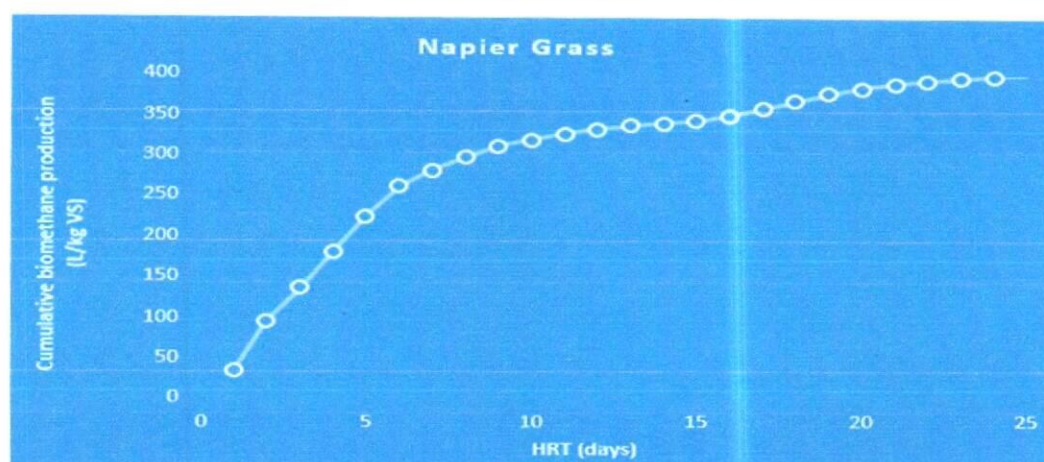
Napier grass, also known as elephant grass, is a productive and versatile forage grass native to Africa and Southeast Asia. Napier Grass is an ideal substrate for biogas Production. In India, the reported annual production yield of Napier grass ranges from 150-200 tonnes per acre per year, which is significantly higher (25-35 tonnes per hectare) compared to other energy grasses like miscanthus and switchgrass.

Composition of Super Napier grass		
Parameters, %	Fresh, %	Dry Matter, %
Crude Protein, %	1.21	8.12
Crude Fibre, %	5.37	36.02
Crude Fat, %	10.12	67.87
Moisture, %	85.09	-
Ash, %	1.01	6.77
Neutral Detergent Fibre, %	10.2	68.41

Napier grass is categorised as lignocellulosic biomass, with its carbohydrate composition typically consisting of 35-39 per cent cellulose, 19-23% xylan and 15-19% lignin on a dry mass basis. With an energy output-to-input ratio of approximately 25:1, it emerges as one of the most promising energy crop.

Studies have shown that Napier Grass has a high methane yield due to higher cellulose and crude protein, making it an efficient source of Bio-CNG with the potential for significant energy output. The cultivation of Super Napier stick seed grows very easy and fast and get the height of 6 feet in 30 days. This fast-growing perennial grass can reach a height of 10-15 feet and can be harvested 5-6 times annually. Below is the presentation of Bio methane Potential of Napier Grass:

Bio methane Potential of Napier Grass				
S. No.	Solid loading (%)	HRT (days)	Inoculum (%)	Bio methane production (L/kg VS)
1	5	25	50	400.84



Napier grass, also known as elephant grass, is a productive and versatile forage grass native to Africa and Southeast Asia. Due to its high yield, it is widely used as feed for livestock and in bioenergy applications. While it may be a relatively new energy crop in India, Thai farmers have been cultivating it for over 30 years, with more than 130 varieties. This fast-growing perennial grass can reach a height of 10-15 feet and can be harvested 5-6 times annually.

The first harvest occurs four months after planting, followed by subsequent harvests every two months for up to seven years. Napier grass is categorised as lignocellulosic biomass, with its carbohydrate composition typically consisting of 35-39 per cent cellulose, 19-23 per cent xylan and 15-19 per cent lignin on a dry mass basis. With an energy output-to-input ratio of approximately 25:1, it emerges as one of the most promising energy crops for the creation of cost-effective and efficient bioenergy systems.

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 Uttar Pradesh, 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. RAW MATERIAL SUPPLY ANALYSIS:

As per the data/information provided by client, plant will require ~35 tons per day Napier Grass and ~50-60 ton per day Cow Dung to produce the 2.5 ton Bio-CNG per day.

Required Raw Materials for Plant	
Particular	Quantity
Napier Grass (Yield@ 4.96%)	35 Ton / Day
Cow Dung (Yield@ 1.68%)	50 Ton / Day
Total Raw Material need / day for Feed	85 Ton / Day

Source: Data/Information provided by the client.

Primary feedstock for the plant is cow dung, which the Company has ample supply of, sourced from aggregator who collects it from the nearby dairy farms and municipal sites. This ensures that the initial operation of the plant will be consistently fed with the necessary organic material to achieve the required gas production.

As per the data/information provided by the client, company has made an agreement with Mr. Krishna Kumar from Ghaziabad, we cannot comment on the profile and authenticity of Mr. Krishna Kumar as the agreement is shared with us on the letter head of the company dated 09/10/2024. However, Mr. Krishna Kumar is a cow dung aggregator and collects the raw material from various sites like Ghaziabad Municipal Corporation dumping site, Dairies, Gaushala's etc. as informed by client.

As per this agreement, Mr. Krishna Kumar has visited the site in Bhadauli regarding the supply of cow dung to assess the requirement of the plant and assured to supply Maximum 20 ton per day Cow Dung in INR 500 per ton. We recommend the bank to suggest the client to submit the profile of Mr. Krishna Kumar to verify that the authentication of the raw material supplier.

In addition to cow dung, Company is also cultivating Napier grass on a 10-acre plot of land adjacent to the plant. This crop is known for its high biomass yield (Approx. 200 Tons / Year / Acre) and suitability as a feedstock for biogas production. Phased Approach to Feedstock Utilization:

Initially, the digester will be charged exclusively with cow dung to ensure stable operation and output. As the Napier grass cultivation progresses, Company will gradually incorporate a mix of cow dung and Napier grass into the feedstock. This approach will ensure a smooth transition, maintaining steady biogas output while optimizing our feedstock mix. Once company will have expanded Napier grass cultivation sufficiently, they plan to fully switch to using Napier grass as the primary feedstock.

This will be achieved as Company secure additional land, allowing them to support the plant's full operation sustainably. With this phased transition, promoters are ensuring that the plant will not face any feedstock shortages and will maintain optimal performance throughout its operational lifespan.

5. COST OF RAW MATERIAL:

Cost of cow dung is considered based on the agreement done by the Company as INR 800 per ton including transportation and other charges. Cost of Napier grass is considered as INR 1200 per ton including all other cost as per the market trends as it is cultivated on adjacent land to the proposed by owned by the promoters.

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. 81 CBG/Bio CNG plants are completed and functional in 153 districts and 163 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	2000
Poultry litter	100,000	100	60	6000
Press mud	100,000	150	80	8000
Total				16000

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 	<ul style="list-style-type: none"> Variation in quality of feedstock throughout the year Some projects are designed to take multiple 	<ul style="list-style-type: none"> Technologies are sensitive to the quality of feedstock – slight change in 	<ul style="list-style-type: none"> Year-on-year variation in feedstock price – established feedstock pricing mechanism is 	<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-

<ul style="list-style-type: none"> • Demand supply mismatch - requirement of large storage facility • Unorganized biomass value chain – lack of sufficient collection, processing and transportation facility 	<ul style="list-style-type: none"> • feedstock – optimal operation is a challenge and may also affect the quantity and quality of Bio-CNG • Source segregation is important – receiving non-segregated waste is an operational challenge 	<ul style="list-style-type: none"> • feedstock quality will significantly impact the Bio-CNG production rate • Capital intensive technologies high upfront project cost 	<ul style="list-style-type: none"> • required. Base price of Bio-CNG should be linked with feedstock cost variation mitigates the economic viability risks • Create market demand for by-products such as Bio manure etc. 	<ul style="list-style-type: none"> • 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 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.

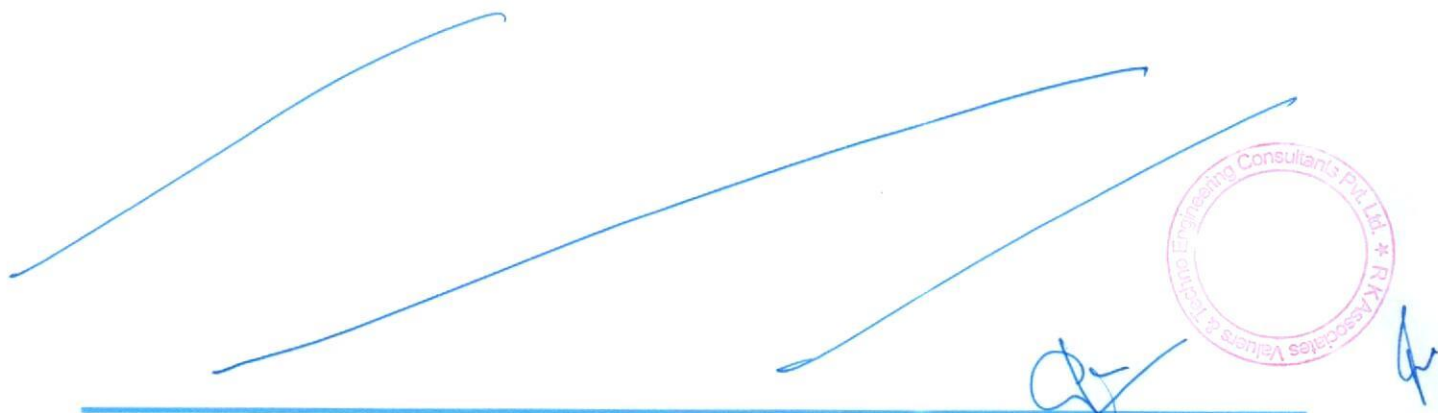
- Ministry of Road Transport and Highways amended the Central Motor Vehicles Rules, 1989 in June 2015 and included the provisions for usage in motor vehicles Bio-CNG produced from waste (including MSW).
- Government of Uttar Pradesh is providing the subsidy of INR 75 lac / Ton under the provision of 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.



PART I

SWOT ANALYSIS

SWOT ANALYSIS	
STRENGTHS	<ul style="list-style-type: none"> • Strategic Location: The project is situated in Ghaziabad Uttar Pradesh. Further availability of agricultural land in western U.P., ensures the supply of Napier grass as farmers are interest towards commercial agriculture & contract farming. Uttar Pradesh has highest number of livestock along with government funded Goshala and dairy farms. FPO also ease the process of supply-chain. Many sugar mills are situated near by the location of the proposed Bio CNG plant ensures the availability of optional feedstock such as sugarcane press mud, rice husk, stubble etc. • 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. • LOI: The produced 2.5 TPD Bio CNG will be supplied to Indraprastha Gas Limited as per the LOI issued by OMC under SATAT scheme, which is an effortless avenue for the project to generate the revenue. <i>(Ref No. – IGL/SATAT/07/19A, Date: 4th December 2023).</i> • Government Support: The project will be entitled to avail incentives of 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. <p>Further, Government of Uttar Pradesh is providing the subsidy of INR 75 lac / Ton under the provision of UP Bio Energy Policy 2022 and project is eligible for 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 INR 1500 / Ton to CBG Plants</p> <ul style="list-style-type: none"> • Technology: The proposed plant will be commissioned with Anaerobic Digestion CSTR technology, which is a proven technology empirically.
	<ul style="list-style-type: none"> • CAPEX: The proposed Bio CNG plant would be set up by a high initial investment, in which ~61% capital would be required for plant & machinery only. • Infrastructure Requirements: The project's power load and water consumption are significant, and ensuring uninterrupted power supply

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 16.26 Crore as shown in the below table along with Means of finance:

Total Project Cost		
S. No.	Capital Cost Head	Amount (INR Crore)
1.	Land Cost	5.35
2.	Building & Civil Works including land development & Boundary Wall	0.00
3.	Plant & Machinery	9.91
4.	Misc. fixed assets	0.15
5.	Interest During Construction (IDC)	0.55
	Sub Total	15.96
6.	Preliminary & Preoperative	0.20
7.	Contingencies at ~1% of Total Project Cost	0.10
	Sub Total	16.26
	Grand Total (TPC)	16.26

Source: Data/Information provided by the company.

Means of Finance		
S. No.	Particular	Amount (INR Crore)
1.	Promoter's Equity	6.35
2.	Term Loan from Bank	9.91
	Total	16.26

Source: Data/Information provided by the company.

Notes:

- It is to be noted that the detailed vetting of the project cost is out of scope of this TEV report and we have relied upon the data/information provided by the client regarding Total Project cost in good faith, however as a TEV consultant we have cross verified the cost of the major components of TPC independently wherever required for the purpose of TEV only.
- As per the agreement to sell dated 16th May 2024, this partially constructed CBG facility has been purchased by the company from M/s Sobti Engineering Works Pvt. Ltd with the land

measuring 6070 Sq. Mt. at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh – 201206.

The said CBG plant is spread over an area of 6070 Sq. Mt. for which M/s ZAK Ventures Pvt Ltd has paid ~INR 5.35 Crore to seller, including land with 7% registration charges, building & civil works, boundary wall and partially constructed digester as informed by client, however any documentary evidence/bill/invoice/bank receipt etc. has not been provided to us by the client against the paid amount claimed by the promoters. We recommend the bank to suggest the client to submit the supporting evidence of paid amount.

As per the land deed *Ref: G-11849 Dated: 10-10-2019* shared by the client, land is in the name of M/s Sobti Engineering Works Pvt. Ltd at present for which CLU was obtained on 11th Aug 2020 from sub-divisional magistrate, Modinagar. Ownership of the land needs to be transfer in the name of M/s ZAK Ventures Renewable Pvt Ltd. We recommend the bank to suggest the client for submit the revised ownership details of the land as and when it's required before disbursement.

As per valuation of the property done by R K Associates dated 01.10.2024 (Ref: VIS (2024-25)-PL398-348-472), fair market value of the land, building & civil works (6329 Sq. Ft. RCC with Brickwork and M.S. Structure & G.I shed, boundary wall and RCC digester is INR 6.03 Crore.

3. As per shared quotations by the client, the estimated cost for plant & machinery will be ~INR 9.91 Crore including 18% applicable GST. ~60% of Total Project Cost is the cost Plant & Machinery.

The estimated cost of the Plant & Machinery has been provided to us by the client as per quotations received by them from various vendors/suppliers. However, as a TEV consultant, the cost of major plant & machinery has been verified by us independently, which we found reasonable & in the permissible range although the cost may change as per specifications & brand.

4. Miscellaneous assets includes office equipment such as laptop, printer, furniture & fixtures and vehicles. The estimated cost of miscellaneous assets is considered as INR 0.15 Crore including GST. However, no any quotations/invoice/bills are provided by the client against the estimated cost. As per general industry practice, we found that the costs are in the line with prevailing market standard. It is to be noted here that the cost vetting of the proposed project cost is out of scope of this report.

5. As per the data/information provided by the client, applicable Interest during Construction (IDC) is 11.00%. Thus the company is required to pay INR 0.55 Crore as IDC from November 2024 to July 2025 (9 months) as per the proposed Loan repayment schedule.
6. Preliminary & Pre-Operative Expenses has been considered based on the estimate of company's resources involvement as INR 0.20 Crore. However, Company did not provide us any invoices/bills against these tentative costs considered. We recommend that the bank/financial institutions advice the company to submit actual cost based on the final quotations/invoices/bills. This will help validate the assertion of different costs considered by the client.
7. Contingency cost of INR 0.10 Crore has been considered based on general assumption and professional experience (~1 of Hard Cost of the Project excluding land).
8. Thus, ~INR 6.50 Crore per ton is the expected CAPEX for the proposed 2,500 KGPD Bio-CNG generating plant including GST, land, pre-operative and preliminary expenses, transportation costs, convey vehicle etc. and Interest during construction. As a TEV consultant we have verified the major costs which we found reasonable & in the permissible range as per the tertiary research done by us, data/information available in the public domain and information provided by the third party consultants/vendors.

For reference, 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. (Ref: <https://pib.gov.in/PressReleasePage.aspx?PRID=1868887>). Some of the other references are shown in the below table:

Reference for Bio Gas Plant			
S. No.	Name of the Party	Contact details	Remarks
2.	M/s Jog Waste to Energy Pvt Ltd	info@jogwte.com +91 9723269295 www.jogwte.com	<ul style="list-style-type: none"> As per JOGWTE, the average installation cost as per EPC basis from scratch to successful trial run would be ranging INR 5.5-6.5 Crore per ton including preliminary and pre-operative expenses and other contingent costs.
3.	The Global Green Growth Institute, GGGI India	nishant.bhardwaj@gggi.org	<ul style="list-style-type: none"> As per information provided by GGGI, The capital expenditure (CAPEX) for a typical 8-10 TPD Bio-CNG plant varies from INR 32-50

			<p>Crore which varies based on the type of biomass feedstock and technology deployed.</p> <ul style="list-style-type: none"> It has been estimated that the plant and machinery costs contributes ~76% of CAPEX. (Excluding preliminary and pre-operative expenses and excluding all other costs such as engineering, consultancy, installation costs etc. i.e. EPC Costs)
4.	Ministry of New & Renewable energy	MNRE	<ul style="list-style-type: none"> The economics of a CBG plant can vary depending on various factors such as the scale of the plant, technology used, feedstock cost, government incentives and market demand for CBG. ~INR 20-25 crore is the cost of installing a 5 TPD capacity CBG plant, while ~75-80% of the CAPEX cost is for purchasing plant machinery.
5.	Others vendors	On the public domain	<ul style="list-style-type: none"> CSTR technology which is flexible for all types of organic wastes including mixed wastes. Capital cost for this technology is approximately INR 4-6 Crore per ton including all the costs from scratch to Successful trial run.

Note: It is to be noted that the detailed cost vetting is out of scope of this TEV and we have done this activity for TEV purpose only.

- The project is proposed to be funded through a term loan of INR 9.91 crores and promoter's Equity of INR 6.35 crores.

PART K

PROJECT IMPLEMENTATION SCHEDULE

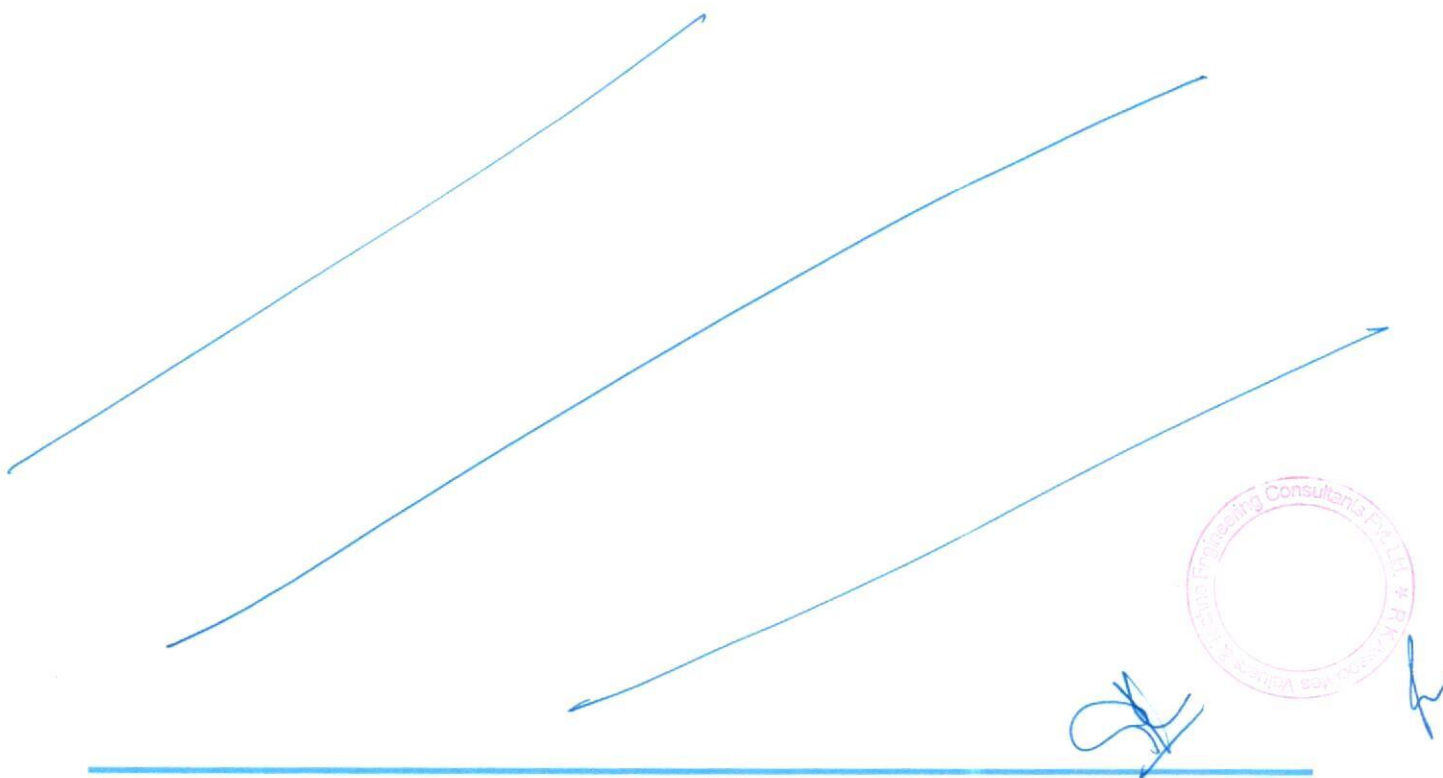
The proposed Bio CNG generating unit is expected to achieve its C.O.D till 1st October 2025, as per the proposed implementation schedule shown in the table below:

S. No.	Particulars	Activity	Expected completion date	Status
1.	Land	Land Procurement	16 th May 2024	CLU is done.
		Land Development	N/A	Scheduled
2.	Sanction of Rupee Term Loan	Sanction of Rupee Term Loan	31 st October 2024	Scheduled
3.	Building & Civil Works	Appointment of Architect	November 2024	Completed
		Building/Layout Plan Preparation	N/A	Completed
		Building Plan Sanction	15 th November 2024	Scheduled
		Appointment of Civil contractor/ developer	31 st November 2024	Scheduled
		Building & Civil Works completion	31 st December, 2024	Scheduled
4.	Plant & Machinery	Finalization of P&M suppliers	1 st November 2024	Scheduled
		Orders to P&M suppliers	November, 2024	Scheduled
		Arrival of P&M	January, 2025	Scheduled
		Installation of P&M	March, 2025	Scheduled
		Utility Installation	May, 2025	Scheduled

5.	Statutory Approvals, registrations & NOCs	From the respective authorities	30 th June, 2025	Pending except the approval obtained as per "Section L"
6.	Finishing & Trail Run	Informed by client	20 th June, 2025	Scheduled
7.	Commercial Operation Date	Informed by client	1 st July 2025	Scheduled

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. Approval/NOC's will be renewed after ownership of land is changed in the name of M/s ZVRPL.
4. This under Construction plant is purchased from M/s Sobti Engineering Works Pvt Ltd and thus it will take lesser time to achieve the C.O.D after financial closure.
5. As per this timeline, the expected C.O.D will be 1st July 2025.




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.	REQUIRED APPROVALS	DATE REFERENCE NO.	STATUS (Approved/ Applied For/ Pending)
1.	Certificate of Incorporation <i>Ministry of Corporate Affairs, Government of India</i>	20 th January 2022 CIN: U40106UP2020PTC138480	Approved
2.	Land conversion to Industrial/Non agriculture <i>Sub Divisional Magistrate, Modinagar, U.P.</i>	11 th August 2020 239/2020	Approved
3.	NOC from Gram Panchayat <i>Gram Panchayat Bhadauli, Ghaziabad, Uttar Pradesh</i>	-	Pending
4.	Labour Licence Registration & grant of license under The Factories Act, 1948 <i>Labour Department, Government of Uttar Pradesh</i>	-	Pending
5.	Building and civil works Plan Sanction Approval <i>Concerned local development authority</i>	-	Pending
6.	Pre-establishment fire NOC <i>Fire and Emergency Services, Government Of Uttar Pradesh</i>	4 th Jan 2022 UPFS/2021/42031/GZB/GH AZIABAD/2975/DD	Approved
7.	Fire NOC (on completion) <i>Fire and Emergency Services, Government Of Uttar Pradesh</i>	-	Will be Applied post C.O.D

8.	New HT line - non domestic /industrial Power Connection <i>Uttar Pradesh Power Corporation Limited</i>	-	Pending
9.	Consent to Establish under Air (Prevention and Control of Pollution) Act, 1981 & Water (Prevention and Control of Pollution) Act, 1974 <i>Uttar Pradesh Pollution Control Board</i>	31 st Jan 2021 118711/UPPCB/Ghaziabad(UPPCBRO)/CTE/GHAZIABA D/2021	Approved
10.	No Objection Certificate (NOC) for ground water abstraction <i>Ground water department (Namami Gange & Rural Water supply department), Ministry of Jal Shakti, Government of Uttara Pradesh</i>	-	Pending
11.	Petroleum & Explosives Safety Organisation (PESO) <i>Ministry of Commerce & Industry, Government of India</i>	12 th Feb 2024 Prior Approval No : G/HO/UP/05/503 & G/HO/UP/06/478(G81259)	Approved
12.	Licence to store compressed gas in cylinders <i>Chief Controller of Explosives Nagpur</i>	8 th Feb 2024 G/HO/UP/06/478(G81259)	Approved

Observation Note:

- As per data/information shared by client, the under construction plant is purchased from M/s Sobti Engineering Pvt Ltd and all the major approval such as PESO, Pollution, Fire NOC etc. were taken by ex-promoters before selling the plant to M/s ZVRPL/ZVPL in the name of Sobti Engineering. Thus, all the approvals are required to apply again to the respective authorities. As informed by the client, Company is in the process to change the ownership of land in the name of Zak Ventures Renewable Pvt Ltd post which all the approval/NOCs will be taken in name of ZVRPL.

2. Consent to establish is valid from 29th Jan, 2021 to 31st March, 2025 (Ref. No. - 118711/UPPCB/Ghaziabad(UPPCBRO)/CTE/GHAZIABAD/2021). It is to be noted here that the approval is in the name of ex-owner M/s Sobti Engineering and the approval was taken with the capacity of Compressed Biogas (CBG) 70, Bio-Fertilizer 1200 (*No measurement unit mentioned*).
3. 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 2026 (9 months) to FY 2036 based on the expected COD and loan tenure as per the best practice in industry to assess the financial feasibility of the project:

A. PROJECTED PROFIT & LOSS ACCOUNT:

Year Ending	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
Year Counter	1	2	3	4	5	6	7	8	9	10	11
Months Counter	9	12	12	12	12	12	12	12	12	12	12
Revenue											
Revenue	4.66	6.94	7.29	7.65	8.04	8.44	8.86	9.30	9.77	10.26	10.77
Cost of Sales											
Raw Material	2.02	3.01	3.16	3.32	3.49	3.66	3.85	4.04	4.24	4.45	4.67
Power & Fuel	0.52	0.78	0.82	0.86	0.90	0.95	1.00	1.05	1.10	1.15	1.21
Salary & Wages	0.46	0.67	0.72	0.78	0.84	0.91	0.98	1.06	1.14	1.23	1.33
Repair & Maintenance	0.04	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.09
Insurance Expenses	0.16	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.10	0.09	0.08
Depreciation	0.51	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Cost of production	3.72	5.37	5.61	5.86	6.13	6.41	6.71	7.03	7.37	7.72	8.10

(INR Crore)

Add: Opening Stock in Process	0.00	0.22	0.26	0.27	0.28	0.30	0.31	0.33	0.35	0.36	0.38
Sub-Total	3.72	5.59	5.87	6.13	6.42	6.71	7.03	7.36	7.71	8.08	8.48
Less: Closing Stock in Process	0.22	0.26	0.27	0.28	0.30	0.31	0.33	0.35	0.36	0.38	0.40
Sub-Total	3.50	5.34	5.60	5.85	6.12	6.40	6.70	7.01	7.35	7.70	8.08
Add: Opening Stocks of Finished Goods	0.00	0.09	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.15
Sub-Total	3.50	5.42	5.70	5.96	6.23	6.52	6.83	7.15	7.49	7.85	8.23
Less: Closing stocks of Finished Goods	0.09	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.15	0.16
Total Cost of Sales	3.41	5.32	5.59	5.84	6.11	6.39	6.69	7.01	7.34	7.70	8.07
Selling, General & administration Expenses	0.13	0.19	0.20	0.21	0.22	0.23	0.24	0.26	0.27	0.28	0.30
Preliminary Expenses written off	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Total Expenses	3.58	5.55	5.83	6.10	6.37	6.63	6.94	7.26	7.61	7.98	8.37
EBIT	1.08	1.40	1.46	1.56	1.66	1.81	1.92	2.04	2.16	2.28	2.40
Interest expenses											
Interest on term loan	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05
Interest on working capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Interest on Unsecured loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Interest Expenses	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05						
Profit before taxes (PBT)	0.27	0.39	0.54	0.74	0.96	1.22	1.44	1.66	1.89	2.12	2.35						
Extraordinary/One Time Income(Expense)	0.00	3.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
PBT post extraordinary item	0.27	4.34	0.54	0.74	0.96	1.22	1.44	1.66	1.89	2.12	2.35						
Applicable Tax	0.00	0.73	0.09	0.12	0.16	0.20	0.24	0.28	0.32	0.40	0.76						
Profit after Taxes (PAT)	0.27	3.62	0.45	0.62	0.80	1.01	1.20	1.38	1.57	1.72	1.59						
Cash Accrual																	
PAT	0.27	3.62	0.45	0.62	0.80	1.01	1.20	1.38	1.57	1.72	1.59						
Add: Dep & Am	0.51	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71						
Preliminary Expenses written off	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00						
Cash Accrual	0.82	4.36	1.20	1.37	1.55	1.72	1.90	2.09	2.28	2.43	2.30						
Repayment Obligations	0.33	0.79	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.96						
Net cash accrual	0.49	3.57	0.30	0.38	0.55	0.73	0.91	1.10	1.29	1.44	1.34						
Cumulative Internal Accruals	0.49	4.07	4.37	4.74	5.30	6.03	6.94	8.04	9.33	10.77	12.11						



B. PROJECTED BALANCE SHEET:

Below table shows the Projected Balance Sheet of the proposed Bio CNG generating project from the period FY 2025 to FY 2036. From 1st November 2024 to 30th June 2025 would be the implementation period of the project:

Year Ending	(INR Crore)												
	31- Mar- 25	30- Jun-25	31- Mar- 26	31- Mar- 27	31- Mar- 28	31- Mar- 29	31- Mar- 30	31- Mar- 31	31- Mar- 32	31- Mar- 33	31- Mar- 34	31- Mar- 35	31- Mar- 36
Year Counter	0	0	1	2	3	4	5	6	7	8	9	10	11
Months Counter	5	3	9	12	12	12	12	12	12	12	12	12	12
Liabilities													
Equity	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
Reserve & Surplus	0.00	0.00	0.27	3.89	4.34	4.96	5.76	6.77	7.97	9.35	10.93	12.65	14.24
Secured Loan	9.91	9.58	8.79	7.89	6.90	5.91	4.92	3.93	2.94	1.95	0.96	0.00	0.00
Unsecured loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current Liabilities													
Trade Payables	0.00	0.00	0.52	0.59	0.62	0.65	0.69	0.72	0.76	0.80	0.84	0.89	0.94
Term liabilities payable within one year	0.00	0.33	0.79	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.96	0.00
CC Limit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Current Liabilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Provision for taxes													



Shareholder's Equity & Liabilities	16.26	16.26	16.72	19.61	19.20	18.86	18.70	18.76	19.01	19.44	20.07	20.84	21.53
Assets													
Land	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
Building & Civil works	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant & Machinery	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55
Electricals & Fittings	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Total Gross Block	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06	16.06
Depreciation	0.00	0.00	0.51	1.22	1.92	2.63	3.34	4.04	4.75	5.46	6.16	6.87	7.57
Net Block	16.06	16.06	15.54	14.84	14.13	13.43	12.72	12.01	11.31	10.60	9.89	9.19	8.48
Other Non-Current Assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Non-Current Assets	16.06	16.06	15.54	14.84	14.13	13.43	12.72	12.01	11.31	10.60	9.89	9.19	8.48
Current Assets													
Trade Receivables	0.00	0.00	0.26	0.30	0.31	0.33	0.34	0.36	0.38	0.40	0.42	0.44	0.46
Inventories	0.00	0.00	0.75	0.88	0.93	0.97	1.02	1.07	1.12	1.18	1.24	1.30	1.36
Cash & Cash Equivalent	0.00	0.00	0.01	2.75	2.94	3.16	3.52	4.34	5.40	6.70	8.23	9.92	11.22
Other Current Assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Current Assets	0.00	0.00	1.01	3.93	4.17	4.46	4.89	5.78	6.91	8.28	9.89	11.65	13.04
Preliminary	0.20	0.20	0.16	0.12	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[illegible]

C. PROJECTED CASH FLOW STATEMENT:

[illegible]

A. SOURCE OF FUND

Net Profit	0.00	0.00	0.27	3.62	0.45	0.62	0.80	1.01	1.20	1.38	1.57	1.72	1.59
Increase in Equity / Share Capital/USL	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in TL	9.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Increase in CC Limit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	0.00	0.00	0.51	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Prelm. Exps. w/off	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Trade payables			0.52	0.07	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05
Total	16.26	0.00	1.34	4.44	1.23	1.40	1.58	1.76	1.94	2.13	2.32	2.47	2.35

B. APPLICATION OF FUNDS

[illegible]

Decrease in Term Loan	0.00	0.00	0.00	0.33	0.79	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.96
Trade Receivable	0.00	0.00	0.00	0.26	0.04	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Inventory	0.00	0.00	0.00	0.75	0.13	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
Other Current Assets	0.00	0.00	0.00	0.00	0.73	0.09	0.12	0.16	-0.13	-0.18	-0.23	-0.28	-0.28	-0.28	0.00	0.00
Prelm. Expenses	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	16.26	0.00	0.00	1.34	1.69	1.04	1.18	1.22	0.93	0.88	0.83	0.79	0.79	0.79	1.04	
Opening Balance	0.00	0.00	0.00	0.00	0.01	2.75	2.94	3.16	3.52	4.34	5.40	6.70	8.23	9.92	11.22	
Net Surplus/ Deficit	0.00	0.00	0.00	0.01	2.75	0.18	0.22	0.36	0.82	1.06	1.30	1.53	1.68	1.30	1.30	
Cumulative Balance	0.00	0.00	0.00	0.01	2.75	2.94	3.16	3.52	4.34	5.40	6.70	8.23	9.92	11.22	11.22	
Closing cash & cash equivalent				0.01	2.75	2.94	3.16	3.52	4.34	5.40	6.70	8.23	9.92	11.22	11.22	

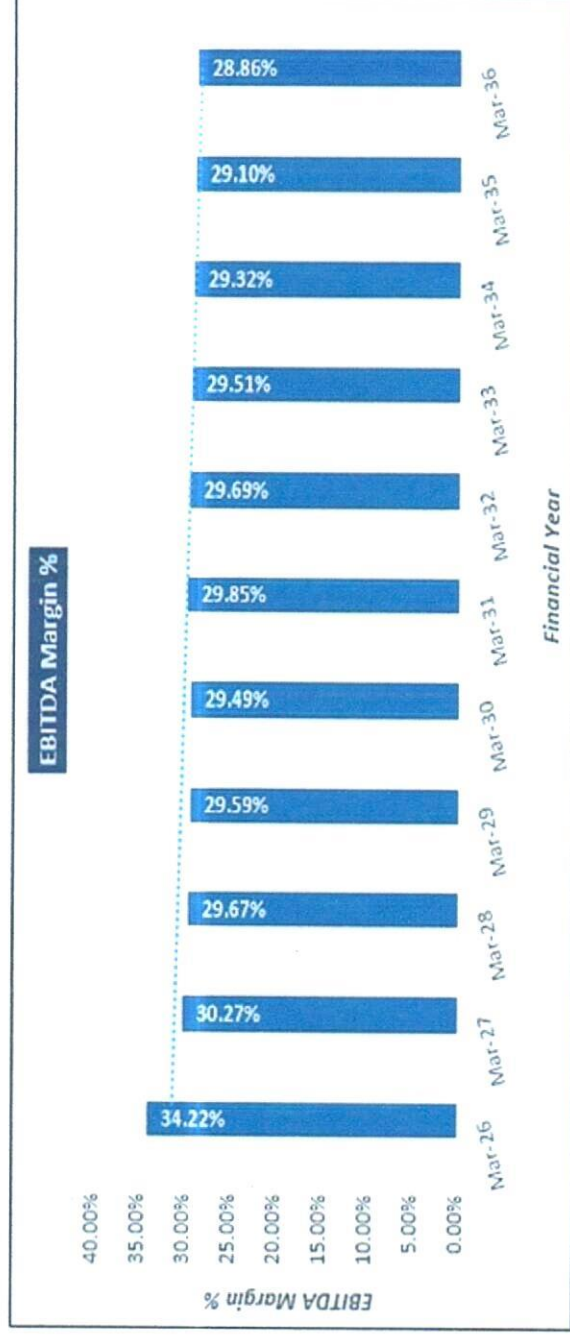
D. KEY FINANCIAL RATIO:

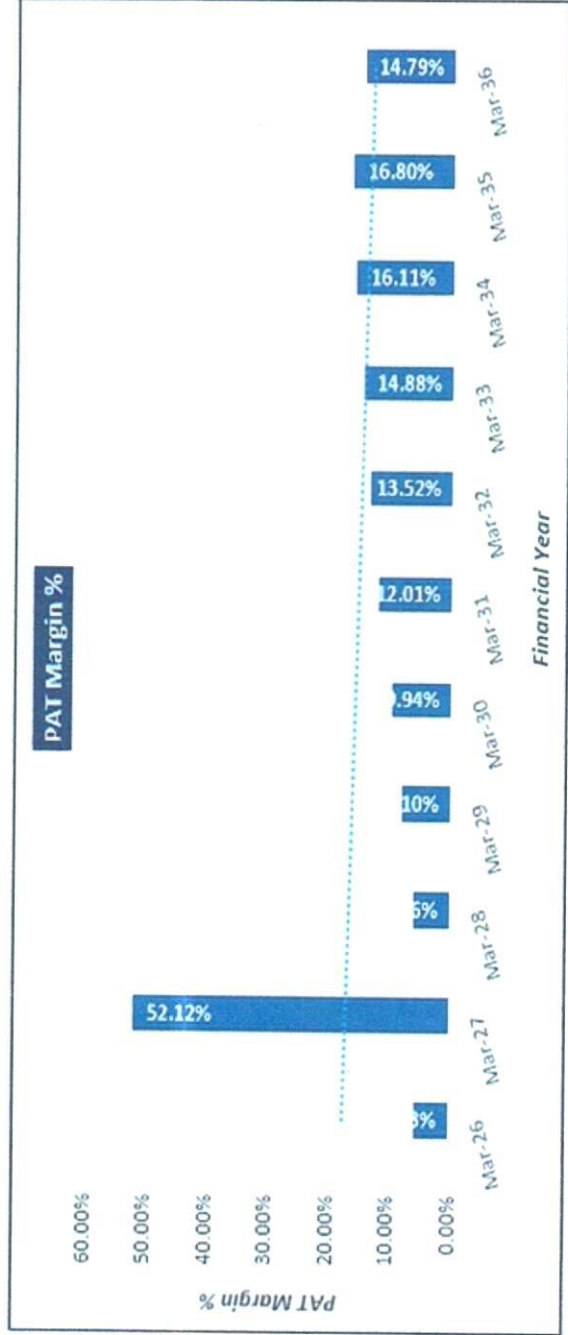
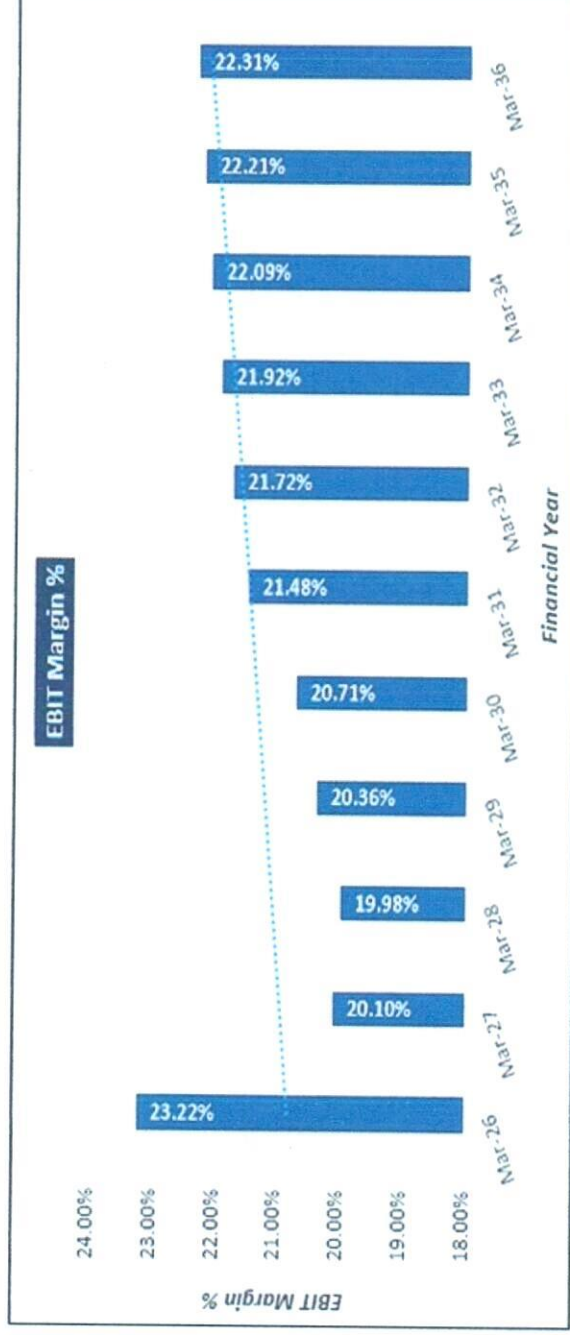
Year Ending	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
Year Counter	1	2	3	4	5	6	7	8	9	10	11
Months Counter	9	12	12	12	12	12	12	12	12	12	12
EBITDA Margin %	34.22%	30.27%	29.67%	29.59%	29.49%	29.85%	29.69%	29.51%	29.32%	29.10%	28.86%
Average	29.96%										
EBIT Margin %	23.22%	20.10%	19.98%	20.36%	20.71%	21.48%	21.72%	21.92%	22.09%	22.21%	22.31%
Average	21.46%										

PAT Margin %	5.83%	52.12%	6.16%	8.10%	9.94%	12.01%	13.52%	14.88%	16.11%	16.80%	14.79%
Average	15.48%										
Revenue growth rate Y-o-Y (%)		49.03%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Average	9.40%										

Note: Revenue growth rate is constant as 5% during the forecasted period since the proposed plant will be operating 90-100% capacity to produce 2.5 TPD CBG as per the LOI with OMC, however the growth of 5% here is due to the escalation in selling price assumed during the forecasted period. PAT margin is growing from 5.83% in FY 2026 to 14.79% in FY 2036 due to the lower interest cost and economies of scale in the later projected years.

E. GRAPHICAL REPRESENTATION OF KEY RATIOS:



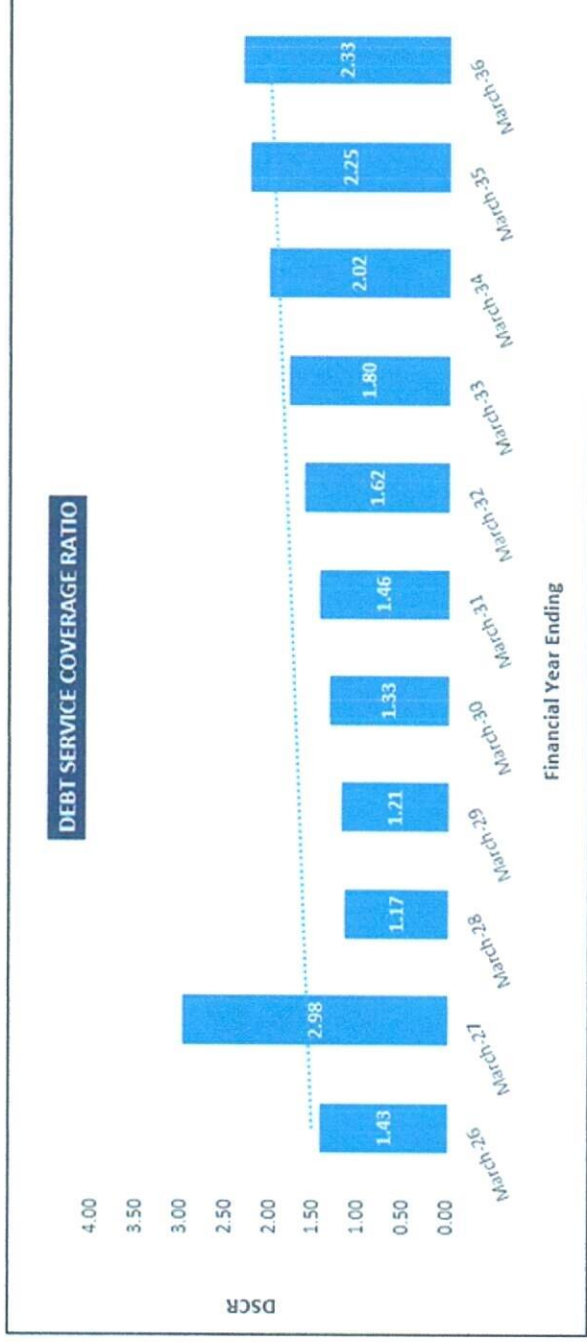


F. ESTIMATED KEY FINANCIAL METRICS:

DEBT SERVICE COVERAGE RATIO (D.S.C.R)

Year Ending	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
	1	2	3	4	5	6	7	8	9	10	11
Year Counter	9	12	12	12	12	12	12	12	12	12	12
Cash accrual	0.82	4.36	1.20	1.37	1.55	1.72	1.90	2.09	2.28	2.43	2.30
Interest on term loan	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05
Interest on Unsecured loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	1.63	5.37	2.11	2.18	2.25	2.32	2.39	2.47	2.55	2.59	2.35
Interest on term loan	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05
Interest on Unsecured loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loan Repayment	0.33	0.79	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.96
Subtotal	1.14	1.80	1.81	1.80	1.70	1.59	1.48	1.37	1.26	1.15	1.01
DSCR	1.43	2.98	1.17	1.21	1.33	1.46	1.62	1.80	2.02	2.25	2.33
Average D.S.C.R	1.78										
Max. D.S.C.R	2.98										





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

		(INR Crore)											
Year Ending	31-Mar-25	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36	
Year Counter	0	1	2	3	4	5	6	7	8	9	10	11	
Months Counter	5	9	12	12	12	12	12	12	12	12	12	12	
EBIT	0.00	1.08	1.40	1.46	1.56	1.66	1.81	1.92	2.04	2.16	2.28	2.40	
Less: Taxes	0.00	0.00	0.73	0.09	0.12	0.16	0.20	0.24	0.28	0.32	0.40	0.76	
Add: Depreciation & Amortisation	0.00	0.51	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	
NOPAT	0.00	1.59	1.38	2.07	2.14	2.21	2.32	2.39	2.47	2.55	2.59	2.35	



Increase/(Decrease) in working capital	0.00	0.00	0.49	0.10	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Capex	16.06	-16.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Free Cash Flow to Firm (FCFF)	-16.06	-16.06	1.11	1.28	2.04	2.11	2.18	2.28	2.36	2.43	2.51	2.31

Key Input for NPV & IRR	
S. No.	Description
1.	Required rate of return 9.58%
2.	Project Risk Premium 0.50%
3.	Discount Rate 10.08%
4.	Expected growth rate(Terminal) 3%
NPV INR 9.05 Crore	
IRR 16.71%	

WACC	
Debt	9.91
Equity	6.35
Total Capital	16.26
Weight of Debt (Wd)	60.96%
Weight of Equity (We)	39.04%
Pre-tax Cost of Debt (Kd)	11.00%
Effective tax rate	27.82%
Post tax Cost of debt	7.94%
Cost of Equity (Ke)	12.14% (Nifty Fifty 10 year CAGR)
WACC	9.58%



Financial Year	Cash Accrual	Accumulated Cash Accrual
Mar-26	0.82	0.82
Mar-27	4.36	5.19
Mar-28	1.20	6.38
Mar-29	1.37	7.75
Mar-30	1.55	9.29
Mar-31	1.72	11.01
Mar-32	1.90	12.92
Mar-33	2.09	15.01
Mar-34	2.28	17.29
Mar-35	2.43	19.72
Mar-36	2.30	22.02
Total	22.02	
Total Project Cost	16.26 Cr.	
Payback Period		8.30 Years

Thus, the project will be having a payback period of **8.30 years** and NPV & IRR of the project is **INR 9.05 Crore & 16.71%** respectively from C.O.D to loan repayment period, which indicates worthiness of the project.

H. SENSITIVITY ANALYSIS:

Sensitivity analysis of the project with respect to 5% & 10% decrease in the revenue, 5% & 10% increase in the cost of raw material and 2% increment in the proposed interest rate has been shown in the below table:

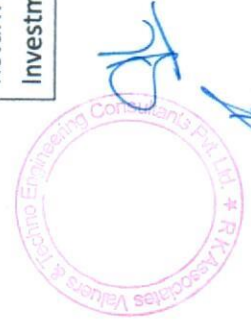


Sensitivity Analysis	Average DSCR	NPV	IRR	Payback Period
As a base case	1.78	INR 9.05 Crore	16.71%	8.30 years
If Sales is decreased by 5%	1.53	INR 4.90 Crore	13.91%	9.76 years
If sales is decreased by 10%	1.31	INR 1.94 Crore	11.63%	12.09 years
If raw material price is increased by 5%	1.68	INR 7.23 Crore	15.51%	8.86 years
If raw material price is increased by 10%	1.57	INR 5.41 Crore	14.26%	9.51 years
If interest rate increased by 2%	1.68	INR 6.27 Crore	15.96%	8.74 years

Observation: The proposed project is found comparatively higher sensitive with respect to the downside variation in the projected revenue, than the upside variation in the projected cost of raw material and any surge in the interest rate.

I. OTHER FINANCIAL RATIOS:

Year Ending	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
Year Counter	1	2	3	4	5	6	7	8	9	10	11
Months Counter	9	12	12	12	12	12	12	12	12	12	12
Return on Capital employed (%)	7.02%	7.70%	8.28%	9.05%	9.77%	10.63%	11.15%	11.56%	11.83%	11.99%	11.67%
Average	10.06%										
Return on Investment (%)	4.28%	57.02%	7.08%	9.77%	12.59%	15.98%	18.88%	21.81%	24.79%	27.15%	25.10%



Average	20.41%										
Return on Net Worth	4.10%	35.35%	4.20%	5.49%	6.60%	7.73%	8.37%	8.82%	9.11%	9.07%	7.74%
Average	9.69%										
DSCR	1.43	2.98	1.17	1.21	1.33	1.46	1.62	1.80	2.02	2.25	2.33
Average	1.78										
ISCR	1.97	2.08	2.36	2.78	3.36	4.23	5.40	7.27	10.65	18.67	60.92
Average	10.88										
Fixed Asset Coverage Ratio	1.77	1.88	2.05	2.27	2.58	3.06	3.85	5.44	-	-	-
Average	2.9										
Current Ratio	1.94	1.99	1.99	1.99	1.98	1.98	1.97	1.97	1.96	1.96	1.95
Average	1.97										
TOL/TNW	1.56	0.93	0.80	0.67	0.55	0.43	0.33	0.24	0.16	0.10	0.05
Average	0.53										
Debt to Equity Ratio	1.51	1.38	1.24	1.09	0.93	0.78	0.62	0.46	0.31	0.15	0.00
Average	0.77										

J. BREAK-EVEN ANALYSIS:

Year Ending	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
	1	2	3	4	5	6	7	8	9	10	11
Year Counter	9	12	12	12	12	12	12	12	12	12	12
Months Counter	9	12	12	12	12	12	12	12	12	12	12
Sales	4.66	6.94	7.29	7.65	8.04	8.44	8.86	9.30	9.77	10.26	10.77

(INR Crore)



Variable Expenses	3.01	4.46	4.70	4.96	5.23	5.52	5.82	6.14	6.48	6.84	7.22
Contribution	1.65	2.48	2.58	2.69	2.80	2.92	3.04	3.16	3.29	3.42	3.55
Fixed Expenses	0.84	1.10	1.11	1.11	1.12	1.13	1.13	1.14	1.15	1.16	1.17
Profit / PBT	0.81	1.38	1.48	1.58	1.68	1.79	1.90	2.02	2.13	2.25	2.38
PV RATIO	35.40%	35.74%	35.46%	35.18%	34.89%	34.59%	34.28%	33.97%	33.64%	33.31%	32.96%
BEP Sales	2.36	3.08	3.12	3.16	3.21	3.26	3.31	3.37	3.43	3.49	3.56
BEP%	50.69%	44.40%	42.82%	41.33%	39.92%	38.60%	37.35%	36.18%	35.08%	34.05%	33.08%

K. TERM LOAN INPUTS:

Term Loan Repayment Inputs	
Total loan amount	INR 9.91 Crore
Interest During Construction	11.00%
Rate of Interest	11.00%
1st Disbursement	Nov-24
IDC Start & End Month	Nov-24 to June-25
IDC Period (construction period)	08 Month
Commencement /Operation Start	July-25
Moratorium Start & End Month (only interest to pay)	Nov 24 to Oct 25
Moratorium Period after COD	4 Month
Repayment Start	Nov-25
Repayment End	March-36
Repayment Period	125 Months

(Handwritten signature and stamp)

(INR Crore)													
Year Ending	31-Mar-25	30-Jun-25	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36
Year Counter	0	0	1	2	3	4	5	6	7	8	9	10	11
Months Counter	5	3	9	12	12	12	12	12	12	12	12	12	12
Opening Bal	0.00	9.91	9.91	9.58	8.79	7.89	6.90	5.91	4.92	3.93	2.94	1.95	0.96
Disbursement	9.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.33	0.79	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.96
Closing Principal o/s	9.91	9.91	9.58	8.79	7.89	6.90	5.91	4.92	3.93	2.94	1.95	0.96	0.00
Interest	0.27	0.27	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05
IDC	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TL Interest	0.00	0.00	0.81	1.01	0.92	0.81	0.70	0.60	0.49	0.38	0.27	0.16	0.05

L. DEPRECIATION SCHEDULE (STRAIGHT LINE METHOD):

(INR Crore)						
Particulars	Life Years	Amount	IDC & Contingencies	Total CoP	SLM Rate	WDV rate
Land Cost		5.35	0.00	5.35	0.00%	0.00%
Building & Civil Works	30	0.00	0.00	0.00	3.17%	10.00%
Plant & Machinery	15	9.91	0.64	10.55	6.33%	15.00%
Misc. fixed assets	10	0.15	0.01	0.16	9.50%	10.00%
Total Cost of Project		15.41	0.65	16.06		



(INR Crore)

Depreciation Schedule as per Company's Act, 2013													
Particular	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36		
Land	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35		
SLM Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Building & Civil Works	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
SLM Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Plant & Machinery	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55		
SLM Depreciation	0.50	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69		
Misc. fixed assets	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16		
SLM Depreciation	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
Total SLM Depreciation	0.51	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71		

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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 2036, 10 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 July, 2025.</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 the quantity of the proposed production as per the letter of intent (LOI) with the OMC (IGL) IGL/SATAT/07/19A and pricing circular of Compressed Bio Gas under SATAT scheme CO/AE&SD/01 dated 20th May 2022.</p> <p>d. Expense modelling has been done based on the required resources and current market inputs such as cost, supply etc. and few expenses are projected as % of futuristic sales as per the best practice of the industry.</p> <p>e. The plant is assumed to be operational for 350 days for 24 hours annually, while operation days are 274 in FY 2026 due to implementation period till 30th June 2025.</p>																				
2.	Revenue Build up	<p>a. Company will be generating the revenue by selling 2.5 TPD Bio-CNG to IGL as per LOI with OMC dated 4th Dec 2023 (Ref: IGL/SATAT/07/19A) and 15 TPD fermented organic solid manure/fertilizer as its by-products. Below table shows the Revenue of the company @ 100% capacity:</p> <table><tr><th colspan="4">Revenue @100% capacity</th></tr><tr><th>Products</th><th>Unit Price</th><th>Annual Quantity</th><th>Amount (INR)</th></tr><tr><td>Bio-CNG</td><td>59.06 INR/Kg</td><td>8,75,000 kg</td><td>5,16,77,500</td></tr><tr><td>Bio Fertilizer</td><td>2.75 INR/Kg</td><td>52,49,982.50 kg</td><td>1,44,37,452</td></tr><tr><td colspan="3">Total Revenue (INR)</td><td>6,61,14,952</td></tr></table>	Revenue @100% capacity				Products	Unit Price	Annual Quantity	Amount (INR)	Bio-CNG	59.06 INR/Kg	8,75,000 kg	5,16,77,500	Bio Fertilizer	2.75 INR/Kg	52,49,982.50 kg	1,44,37,452	Total Revenue (INR)			6,61,14,952
Revenue @100% capacity																						
Products	Unit Price	Annual Quantity	Amount (INR)																			
Bio-CNG	59.06 INR/Kg	8,75,000 kg	5,16,77,500																			
Bio Fertilizer	2.75 INR/Kg	52,49,982.50 kg	1,44,37,452																			
Total Revenue (INR)			6,61,14,952																			

		<p>b. Thus the company is expected to generate INR 6.94 Crore annual revenue if operates @100% capacity. In the initial year there are 274 operating days and projected revenue of the company is 4.66 Cr. which is expected to increase up to INR 10.577 Crore till FY 2036.</p> <p>c. Revenue of the Company is expected to grow at the rate of 5% Y-o-Y basis from FY 2029, since selling price are assumed to be inflated @5% during the forecasted period based on the average inflation of Indian economy since last 3 years. Further, as per the tertiary research, since 2021, the price of CNG has increased by ~73%, while the price of petrol has increased by 13% and the price of diesel has increased by almost 20%.</p> <p>d. Further, the project is eligible to get the financial assistance from Central and State governments which comes up to 3.96 Crore, this subsidy is considered in FY 2027 as inflow to the company's revenue and shown as an Extraordinary item in projected P& L.</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 59.06 per kg</td></tr><tr><td>Selling price of solid organic fertilizer</td><td>INR 2.75 per kg</td></tr></table> <p>b. Company has already signed a LOI with Indian Oil Corporation Ltd dated 4th December 2023 (Ref: IGL/SATAT/07/19A). However signing commercial agreement between IOCL & company is in the process and Retail outlet for procurement will be allocated before C.O.D.</p> <p>c. As informed by the client, company has planned to sell its Bio CNG at a Retail Outlets of IGL at Ghaziabad in Uttar Pradesh. The current retail selling price of CNG at OMC outlets in Ghaziabad is</p>	Selling price per unit		Products	Unit prices	Selling price of Bio-CNG	INR 59.06 per kg	Selling price of solid organic fertilizer	INR 2.75 per kg
Selling price per unit										
Products	Unit prices									
Selling price of Bio-CNG	INR 59.06 per kg									
Selling price of solid organic fertilizer	INR 2.75 per kg									

		<p>around INR 79.70 per kg in October, 2024. (https://www.goodreturns.in/cng-price-in-ghaziabad.html). The procurement price of Bio-CNG at IGL as per the SATAT Scheme falls under the slab of INR 59.06 per kg without GST. (https://satat.co.in/satat/assets/download/CBG%20Pricing%20Circular%20-%20Stakeholders.pdf). Kindly refer "Section F" of the report for detailed proposed pricing arrangements.</p> <p>d. As informed by client, Fermented organic fertilizer would be sold out to the farmers directly @ INR 2.75 per kg in the exchange of Cow dung. Other than this arrangement, Government of U.P. issued the government order number 43/2022/1101/87-8(1) AESD/2022 dated 3rd October 2022 and making the mandatory provision for sale of Bio fertilizer on Government Licensed fertilizers shop in the state under the clause of 2.4 of UP Bio Energy Policy 2022.</p> <p>Additionally, in a significant move towards promoting sustainable agriculture, 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).</p> <p>e. An escalation factor of 5% has been considered in the prices of the sellable products during the forecasted periods considering the micro and macro-economic factors.</p>
1.	Capacity Utilization	<p>a. The plant will be operating @90% capacity utilization in the initial year.</p> <p>b. The proposed CBG generating plant will be commissioned with a Design capacity of 6,250 M3/Day which can generate ~2.5 TPD Bio CNG per day, company has proposed to operate the plant at 100% of the designed capacity to generate 2500 Kg Bio-CNG per day as</p>

		per letter of Intent (LOI) with Indraprastha Gas Limited under SATAT scheme.
2.	Capital Expenditure	<p>a. As per the agreement to sell dated 16th May 2024, this partially constructed CBG facility has been purchased by the company from M/s Sobti Engineering Works Pvt. Ltd with the land measuring 6070 Sq. Mt. at Khasra No. 946, Khata No. 631, Village - Bhadauli, District - Ghaziabad, Uttar Pradesh – 201206.</p> <p>b. The said CBG plant is spread over an area of 6070 Sq. Mt. for which M/s ZAK Ventures Pvt Ltd has paid ~INR 5.35 Crore to seller, including land with 7% registration charges, building & civil works, boundary wall and partially constructed digester as informed by client, however any documentary evidence/bill/invoice/bank receipt etc. has not been provided to us by the client against the paid amount claimed by the promoters. We recommend the bank to suggest the client to submit the supporting evidence of paid amount.</p> <p>c. As per the land deed Ref: G-11849 Dated: 10-10-2019 shared by the client, land is in the name of M/s Sobti Engineering Works Pvt. Ltd at present for which CLU was obtained on 11th Aug 2020 from sub-divisional magistrate, Modinagar. Ownership of the land needs to be transfer in the name of M/s ZAK Ventures Renewable Pvt Ltd. We recommend the bank to suggest the client for submit the revised ownership details of the land as and when it's required before disbursement.</p> <p>d. As per valuation of the property done by R K Associates dated 01.10.2024 (Ref: VIS (2024-25)-PL398-348-472), fair market value of the land, building & civil works (6329 Sq. Ft. RCC with Brickwork and M.S. Structure & G.I shed, boundary wall and RCC digester is INR 6.03 Crore.</p> <p>e. Therefore, the cost of under construction plant as INR 5.35 Crore</p>

		<p>including land with 7% registration charges, building & civil works, boundary wall and partially constructed digester seems to be reasonable and on conservative side.</p> <p>f. As per shared quotations by the client, the estimated cost for plant & machinery will be ~INR 9.91 Crore including 18% applicable GST. ~60% of Total Project Cost is the cost Plant & Machinery.</p> <p>The estimated cost of the Plant & Machinery has been provided to us by the client as per quotations received by them from various vendors/suppliers. However, as a TEV consultant, the cost of major plant & machinery has been verified by us independently, which we found reasonable & in the permissible range although the cost may change as per specifications & brand.</p> <p>g. Miscellaneous assets includes office equipment such as laptop, printer, furniture & fixtures and vehicles. The estimated cost of miscellaneous assets is considered as INR 0.15 Crore including GST. However, no any quotations/invoice/bills are provided by the client against the estimated cost. As per general industry practice, we found that the costs are in the line with prevailing market standard. It is to be noted here that the cost vetting of the proposed project cost is out of scope of this report.</p> <p>h. As per the data/information provided by the client, applicable Interest during Construction (IDC) is 11.00%. Thus the company is required to pay INR 0.55 Crore as IDC from November 2024 to July 2025 (9 months) as per the proposed Loan repayment schedule.</p> <p>i. Preliminary & Pre-Operative Expenses has been considered based on the estimate of company's resources involvement as INR 0.20 Crore. However, Company did not provide us any invoices/bills against these tentative costs considered. We recommend that the bank/financial institutions advice the company to submit actual</p>
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		<p>cost based on the final quotations/invoices/bills. This will help validate the assertion of different costs considered by the client.</p> <p>j. Contingency cost of INR 0.10 Crore has been considered based on general assumption and professional experience as per the best practice in the industry. (~1 of Hard Cost of the Project excluding land).</p> <p>a. Hence, INR 6.50 Crore per ton including land, GST, transportation IDC, pre-operative and preliminary expenses etc. will be the capex for this proposed plant, which we found in the line with industrial and sectoral benchmarks. Out of total project cost, ~60% is the cost of plant & Machinery for the proposed plant.</p> <p>As per Ministry of New and Renewable energy, the approx. CAPEX of installing a 5 TPD capacity CBG plant is estimated between INR 20-25 crore and ~75 80% of the CAPEX cost is for purchasing plant machinery.</p> <p>https://cdn.cseindia.org/attachments/0.11235300_1687759489_cse---overview-and-current-status-of--cbg-in-india.pdf).</p>
3.	Expenses	<p>a. The proposed plant will be required a mix of 50 ton per day Cow dung and 35 ton per day Napier grass to generate the required input.</p> <p>b. Primary feedstock for the plant is cow dung, which the Company has ample supply of, sourced from aggregator who collects it from the nearby dairy farms and municipal sites. This ensures that the initial operation of the plant will be consistently fed with the necessary organic material to achieve the required gas production.</p> <p>As per the data/information provided by the client, company has made an agreement with Mr. Krishna Kumar from Ghaziabad, we cannot comment on the profile and authenticity of Mr. Krishna kumar as the agreement is shared with us on the letter head of</p>

the company dated 09/10/2024.

As per this agreement Mr. Krishna Kumar has visited the site in Bhadauli regarding the supply of cow dung to assess the requirement of the plant and assured to supply Maximum 20 ton per day Cow Dung in INR 500 per ton. We recommend the bank to suggest the client to submit the profile of Mr. Krishna kumar to verify that the authentication of the raw material supplier.

In addition to cow dung, Company is also cultivating Napier grass on a 10-acre plot of land adjacent to the plant. This crop is known for its high biomass yield (Approx. 200 Tons / Year / Acre) and suitability as a feedstock for biogas production. Cost of Napier grass is will be costing as INR 1200 per ton including all other cost as per the market trends.

- c. As per information provided by the client, estimated annual consumption of the power will be ~2,500 Kwh per day. Applicable tariff in Uttara Pradesh is INR 8.50 per Kwh. An escalation rate of 5% is assumed on it.
- a. As per the data/information provided by the client, ~19 employees will be deployed initially based on the requirement. 8% escalation rate has been considered on the salary & wages of the proposed manpower.
- b. Transportation cost has been considered as 2% of the total revenue after assessing the distance of proposed IGL's RO from the project location as promoters will use their existing channels for selling & Marketing of the product.
- c. Maintenance of the plant has been considered as per the industrial trends as shown in the below table:

Maintenance on Plant (% of Gross Block)	
Land Cost	0.20%
Building & Civil Works	0.40%

		Plant & Machinery	0.40%
		Misc. fixed assets	0.25%
		<p>d. Plant and Administrative Overhead Expenses and Insurance Expenses are considered as 0.50% of revenue and 1% of net block respectively during the projected period.</p> <p>e. Other manufacturing expenses are considered as 0.25% of Revenue.</p>	
4.	Term Loan	<p>a. The project is proposed to be funded through a term loan of INR 9.91 crores and promoter's equity of INR 6.35 crores.</p> <p>b. Interest rate has been considered as 11% on the term loan as per informed by the bank.</p> <p>c. Further, as per the working capital assessment, the working capital will require as INR 0.48 Crore initially, which will be arranged by the promoters.</p>	

Key Findings:

1. Average DSCR, EBIDTA margin, EBIT margin is 1.78, 29.96%, and 21.46% respectively during the estimated period.
2. D.S.C.R of the proposed Bio CBG plant is found highly sensitive with respect to any downside fluctuation in the projected revenue.
3. The company is having a positive NPV and IRR of INR 9.05 Crore and 16.71% respectively from C.OD to loan repayment period while it may vary with changes in the assumptions & micro and macro-economic trends considered as on date.
4. The proposed project is having a payback period of 8.30 years.
5. 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.

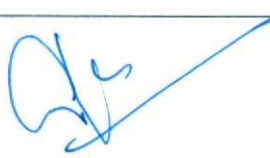

As per financial projections for the estimated period, **Average DSCR, EBITDA Margin and EBIT Margin** of the project are **1.78, 29.96% and 21.46%** respectively, where higher DSCR is the indicator of the project capability to pay out its outstanding debt and EBITDA margin shows the capability of the project to generate the operating profits over the forecasted period. Also the project is having the payback period of **8.30 Years** in the line with sectoral trends.

The proposed Bio-CNG generating facility is having a positive **NPV and IRR** as **INR 9.05 Crore** and **16.71%** respectively from C.O.D till loan repayment period 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.

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 ZAK Ventures 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 M/s ZAK Ventures Private Limited.</p>
Number of Pages in the Report	107
Enclosed Documents	Disclaimer & Remarks 102-105
Place	Noida
Date	15 th November 2024

FOR ON BEHALF OF M/S. R.K. ASSOCIATES VALUER & TECHNO ENGINEERING CONSULTANTS PVT. LTD.		
SURVEYED BY	PREPARED BY	REVIEWED BY
Mr. Sachin Pandey	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



फार्म फ / FORM F
नियम 50, 51 और 54 देखें / (See Rules 50, 51 and 54)
Licence to store compressed gas in cylinders

अनुज्ञप्ति संख्या/ Licence No. : G/HO/UP/06/478(G81259) वार्षिक शुल्क/ Fee Rs. 2000/- per year

M/s. M/S. SOBTI ENGINEERING WORKS PVT LTD, 7/12, 3RD FLOOR, SOUTH PATEL NAGAR, City: New Delhi, District: DELHI, State: Delhi, Pin: 110008 को नीचे वर्णित और रेखांक संस्था G/HO/UP/06/478(G81259) dated 08/02/2022 में दर्शित किए गए अनुज्ञप्ति परिसर में, भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों के उपबंधों तथा इस अनुज्ञप्ति की अन्य शर्तों के अधीन रहते हुए, केवल संपीड़ित गैस से भरे सिलिण्डरों को रखने के लिए ही विधिवानु अनुज्ञप्ति दी जाती है। / Licence is hereby granted to M/s. M/S. SOBTI ENGINEERING WORKS PVT LTD, 7/12, 3RD FLOOR, SOUTH PATEL NAGAR, City: New Delhi, District: DELHI, State: Delhi, Pin: 110008 valid only for the possession of cylinders filled with compressed gas in the licensed premises described below and shown in the plan No G/HO/UP/06/478(G81259) dated 08/02/2022 subject to the provisions of the Explosives Act, 1884(4 of 1884) and the Rules made thereunder and to the further conditions of this licence.

यह अनुज्ञप्ति 30 सितम्बर 2026 तक प्रवृत्त रहेगी। / The Licence shall remain in force till the 30th September 2026.

For Chief Controller of Explosives
Nagpur
कृते मुख्य विस्फोटक निरीक्षक
नागपुर

February 8, 2022


अनुज्ञप्ति परिसर का विवरण और अवस्थिति / DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

निम्नलिखित विवरण के अनुसार सिलिण्डरों में भरी गैस रखने के लिए अनुज्ञप्ति परिसर, जिसकी अभिन्यास सीमाओं और अन्य विशिष्टियों को संलग्न अनुमोदित रेखांक सं G/HO/UP/06/478 dated February 8, 2022 में दिखाया गया है, में अवस्थित है और जिसमें एक भण्डारण शेड है। / The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. G/HO/UP/06/478 dated February 8, 2022 are situated at Ghaziabad and consists of a storage shed for possession of the gas contained in cylinders as described here under:

गैस का प्रकार / Type of Gas	मात्रा / Quantity
a) विषैले/ Toxic	--NIL--
b) गैर विषैले और गैर ज्वलनशील /Non-Toxic and Non Flammable	--NIL--
c) गैर विषैले और ज्वलनशील /Non-Toxic and Flammable	COMPRESSED NATURAL GAS (CNG) - 40 Nos.
d) घुलित एसिटिलीन गैस /Dissolved Acetylene Gas	--NIL--
e) एलपीजी के अलावा गैर विषैले और ज्वलनशील द्रवित गैस /Non-Toxic & Flammable liquefiable gas other than LPG	--NIL--
f) एलपीजी/ Liquefied Petroleum Gas	--NIL--

और प्लॉट संख्या Plot No. : -- गली का नाम गांव : Ghaziabad या नगर पुलिस थाना : Murad Nagar जिला : GHAZIABAD, राज्य : Uttar Pradesh. / and is situated at Plot No. : -- Village/Town : Ghaziabad Police Station : Murad Nagar District : GHAZIABAD, State: Uttar Pradesh.

नवीकरण के पृष्ठानक के लिए स्थान / SPACE FOR ENDORSEMENT OF RENEWALS



भारत सरकार / Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन /Petroleum & Explosives Safety Organisation (PESO)
63/4, ए-विंग, दूसरा तल, केंद्रालय (सी.जी.ओ. कॉम्प्लेक्स), संजय प्लेस
आगरा - 282002
63/4, A-Wing , IInd floor,
Kendralaya (CGO Complex), Sanjay Place,
Agra - 282002

ईमेल /E-mail : jtcceagra@explosives.gov.in
दूरभाष /Phone/Fax No : 0562 - 2523244, 2523266
दि/Date : 12/02/2024

सं/No : G/HO/UP/05/503 & G/HO/UP/06/478(G81259)

सेवा में /To,

M/s. M/S. SOBTI ENGINEERING WORKS PVT LTD,
7/12, 3RD FLOOR, SOUTH PATEL NAGAR,
New Delhi,
District: DELHI
State: Delhi
Pin : 110008

विषय/Sub : Plot No. --, 946a Bhadauli, , Ghaziabad, Ghaziabad, Taluka: Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, Pin : 201206में सिलिण्डरों में COMPRESSED NATURAL GAS (CNG) गैस का भरण एवं भण्डारण गोडाउन. गैस सिलिण्डर, सं नियम, 2016 के अंतर्गत फार्म 'इ' एवं 'एफ' में जारी अनुज्ञप्ति सं. G/HO/UP/05/503 & G/HO/UP/06/478(G81259) नवीकरण के बारे में / Filling of COMPRESSED NATURAL GAS (CNG) and Storage of COMPRESSED NATURAL GAS (CNG) at Plot No. --, 946a Bhadauli, , Ghaziabad, Ghaziabad, Taluka: Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, Pin : 201206 Licence No. G/HO/UP/05/503 & G/HO/UP/06/478(G81259) granted in Form E & F of Gas Cylinders Rules, 2016 - Renewal regarding

महोदय/Sir(s),

कृपया आपके दि. 17/10/2023 के पत्र सं. NIL का संदर्भ ग्रहण करें/ Please refer to your application No.NIL dated 17/10/2023 .

अनुज्ञप्ति संख्या G/HO/UP/05/503 & G/HO/UP/06/478 30th Septemebr, 2026 तक नवीनीकृत कर भेजी जा रही है / Licence Number: G/HO/UP/05/503 & G/HO/UP/06/478 is renewed and valid upto 30th Septemebr, 2026 is forwarded herewith.

कृपया नोट करें कि गैस सिलिण्डर नियम, 2016 के नियम 55(5) के अनुसार, अनुज्ञप्ति के पुनः नवीकरण हेतु आवेदन The Jt. Chief Controller of Explosives, Central Circle, Agra इस कार्यालय को इस अनुज्ञप्ति की वैधता समाप्त होने के पूर्व (दिनांक 30 सितम्बर 2026 को या इससे पूर्व) जमा कर दें। दिनांक 30 सितम्बर 2026 के पश्चात परंतु दिनांक 30 सितम्बर 2027 से पूर्व प्राप्त नवीनीकरण आवेदन, गैस सिलिण्डर नियम, 2016 के नियम 55(7) के अनुसार विलंब शुल्क के साथ ही विद्यार्थी होगा। दिनांक 30 सितम्बर 2027 तक कोई नवीनीकरण आवेदन प्राप्त नहीं होने की स्थिति में यह अनुज्ञप्ति स्वतः निरस्त हो जाएगी। /Please note that application for renewal of the licence should be submitted so as to reach the The Jt. Chief Controller of Explosives, Central Circle, Agra before the licence expires (i.e. on or before 30th

1/8/22, 10:24 AM

FIRE SERVICE | UTTAR PRADESH

प्रारूप-छ (संलग्नक-6)

अग्नि सुरक्षा प्रमाणपत्र (पूर्णता (कम्प्लीशन) अनापत्ति प्रमाणपत्र)

यूआईडी संख्या: UPFS/2021/42031/GZB/GHAZIABAD/2975/DD

दिनांक: 28-12-2021

प्रमाणित किया जाता है कि मैसर्स **SOBTI ENGINEERING WORKS PVT LTD** (भवन/प्रतिष्ठान का नाम) पता **946A MURADNAGAR BHADAULI, BHADAULI, GHAZIABAD** तहसील - **MODINAGAR**, प्लॉट एरिया **5747.5 sq.mt**, कुल कवर्ड एरिया **336.00** (वर्ग मीटर), ब्लाकों की संख्या - **1** जिसमें

ब्लॉक / टावर	प्रत्येक ब्लाक में तलों की संख्या	बेसमेंट की संख्या	ऊँचाई
SOBTI ENGINEERING	1	0	04.50 mt.

है। भवन का अधिभोग मैसर्स **SOBTI ENGINEERING WORKS PVT LTD** द्वारा किया जा रहा है। इनके द्वारा भवन में अग्नि निवारण एवं अग्नि सुरक्षा व्यवस्थाएं, एनओसी0 एवं तत्संबंधी भारतीय मानक ब्यूरो के आईएस0 के अनुसार भवन में स्थापित कराई गयी व्यवस्थाओं का निरीक्षण **अग्निशमन अधिकारी** द्वारा दिनांक **01-01-2022** को भवन स्वामी/भवन स्वामी के प्रतिनिधि श्री **MR GAURAV** के साथ किया गया। भवन में अधिस्थापित अग्नि सुरक्षा व्यवस्थाएं मानकों के अनुसार अधिस्थापित पायी गयी। अतः प्रशस्त भवन को अग्नि सुरक्षा प्रमाणपत्र (फायर सेफ्टी सर्टिफिकेट) एनओसी0 की अधिभोग श्रेणी **Industrial** के अन्तर्गत वैधता तिथि **04-01-2022** से **03-01-2025** तक 3 वर्षों के लिए इस शर्त के साथ निर्गत किया जा रहा है कि भवन में नियमानुसार स्थापित सभी अग्निशमन व्यवस्थाओं का अनुरक्षण करते हुए क्रियाशील बनाये रखा जायेगा। भवन में स्थापित की गयी अग्निशमन व्यवस्थाओं में पायी गयी कमी के कारण किसी भी घटना के लिए मैसर्स **SOBTI ENGINEERING WORKS PVT LTD** अधिभोगी पूर्ण रूप से जिम्मेदार होगा/होंगे। निर्गत अग्नि सुरक्षा प्रमाणपत्र का नवीनीकरण निर्धारित समयावधि के अन्दर न कराये जाने पर निर्गत अग्नि सुरक्षा प्रमाणपत्र स्वतः ही निरस्त मान लिया जायेगा, जिसके लिए मैसर्स **SOBTI ENGINEERING WORKS PVT LTD** अधिभोगी पूर्ण रूप से जिम्मेदार होगा/होंगे।

Note : in view of replied by fso in query the noc is being approved.



UTTAR PRADESH POLLUTION CONTROL BOARD

Building. No TC-12V Vibhuti Khand, Gomti Nagar, Lucknow-226010

Phone:0522-2720828,2720831, Fax:0522-2720764, Email: info@uppcb.com, Website: www.uppcb.com

Validity Period :29/01/2021 To 31/03/2025

Ref No. -
118711/UPPCB/Ghaziabad(UPPCBRO)/CTE/GHAZIABAD/2021

Dated:- 31/01/2021

To ,

Shri SATYAM SOBTI
M/s SOBTI ENGINEERING WORKS PVT LTD
Khasra No. 946, Village-Bhaduli
GHAZIABAD

Sub : Consent to Establish for New Unit/Expansion/Diversification under the provisions of Water (Prevention and control of pollution) Act, 1974 as amended and Air (Prevention and control of Pollution) Act, 1981 as amended.

Please refer to your Application Form No.- 11008244 dated - 15/01/2021. After examining the application with respect to pollution angle, Consent to Establish (CTE) is granted subject to the compliance of following conditions :

