



CBG-CGD INTEGRATION (CHALLENGES & WAY FORWARD)

PRESENTED BY:-

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TOPICS COVERED



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CHALLENGES

WAY FORWARD



1. City Gas Distribution (CGD) networks are an interconnected system of underground Natural Gas pipelines for supplying Piped Natural Gas (PNG) to domestic, commercial & industrial segment and Compressed Natural Gas (CNG) to transport sector.
2. Under the Petroleum and Natural Gas Regulatory Board (PNGRB) Act 2006, PNGRB grants the authorization to the entities for developing a City Gas Distribution (CGD) network (including PNG network) in a specified Geographical Area (GA) of the country

Compressed Natural Gas (CNG)

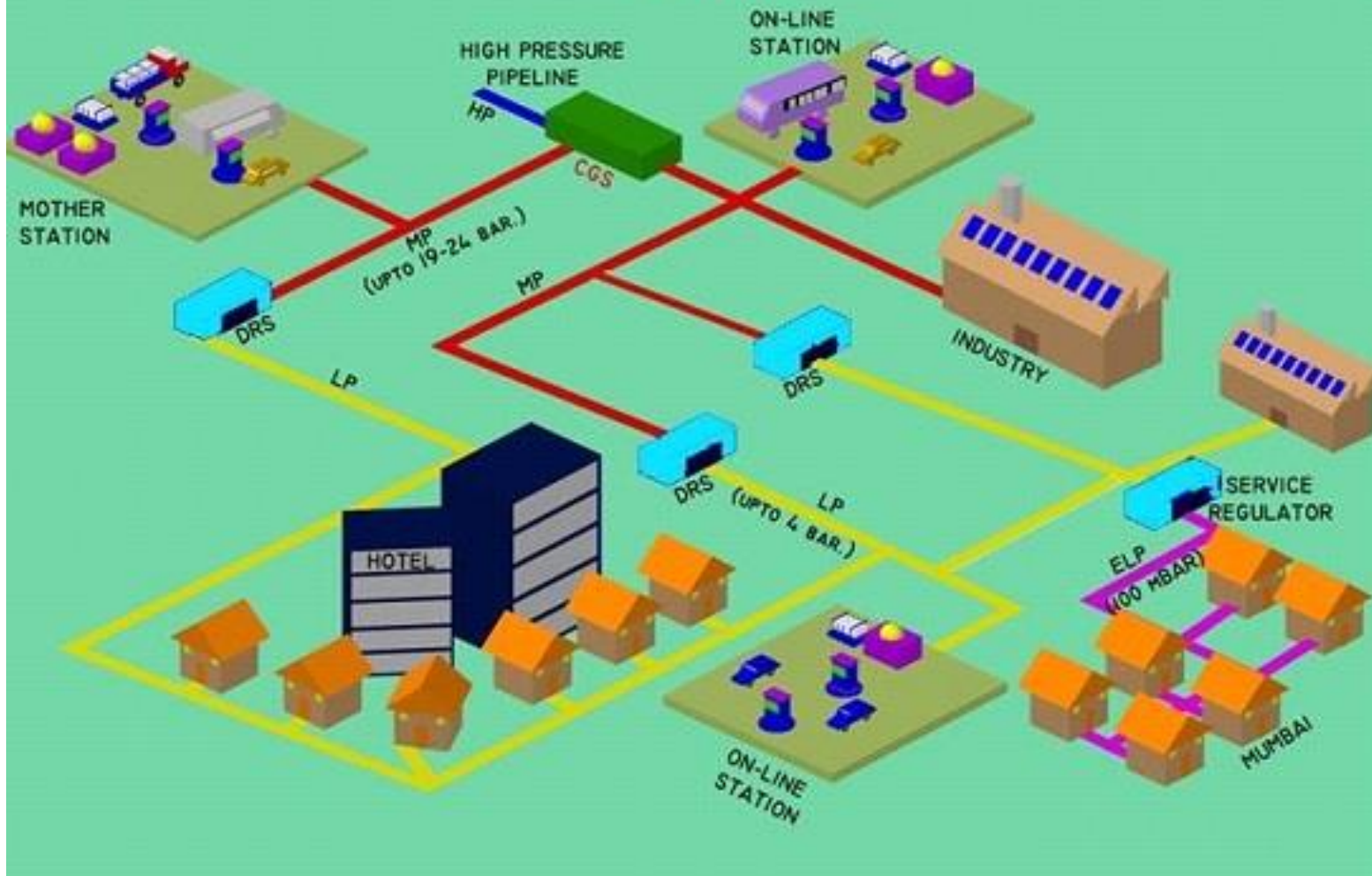
Piped Natural Gas - Industrial / Commercial
(PNG - I & C)

Piped Natural Gas- Domestic (PNG-D)

CGD STRUCTURE



CITY GAS DISTRIBUTION SYSTEM (CGD) IN INDIA





DESCRIPTION	TOTAL NO.
No. of CNG Stations	882
No. of Domestic Customers	27 Lakhs Approx.
No. of Commercial Customers	6041
No. of Industrial Customers	4793
CONTRACTED CBG PLANT	06

MAJOR PLAYERS OF CGD



Indraprastha Gas Limited

MahaNagar Gas Ltd

GAIL Gas Limited

Gujarat Gas Ltd

IndianOil-Adani Gas Pvt. Ltd

Atlantic Gulf & Pacific (AG&P PRATHAM)

SKN-Haryana City Gas Distribution Pvt.Ltd.

Avantika Gas Ltd

Sabarmati Gas Ltd

Assam Gas Company Ltd

Adani Total Gas Ltd.

Torrent Group

NATION-WIDE GAS REQUIREMENT



India's natural gas consumption in 2022-23 was about **185 million metric standard cubic meters per day (MMSCMD)**.

The government's current plans would triple natural gas consumption from **185 MMSCMD to 500 MMSCMD by 2030**, supporting auxiliary businesses that rely on natural gas. This demonstrates the government's dedication to supporting a healthy ecology for the production and distribution of natural gas.



Source : <https://www.goodreturns.in/news/government-initiatives>



India's average natural gas production in 2023-24 was about **100 million metric standard cubic meters per day (MMSCMD) approx.**

Total imports of natural gas in 2023-24 was about **46% of the total consumption.**

Source : [Centre for Monitoring Indian Economy Pvt. Ltd.](#)

INTRODUCTION TO CBG



Compressed Biogas (CBG) is produced through the anaerobic digestion of organic materials. The primary ingredients or feed-stocks used in CBG production include:

1. **Agricultural Residues:** Crop residues (e.g., straw, husks, stalks) and Animal manure (e.g., cow dung, pig manure)
2. **Energy Crops:** Dedicated energy crops like Napier grass (*Pennisetum purpureum*), maize silage, and sorghum.
3. **Organic Waste:** Food waste from households, restaurants, and food processing industries and Garden and green waste
4. **Industrial Waste:** Organic waste from agro-industries, such as sugarcane bagasse, spent grains from breweries, and fruit processing waste.
5. **Sewage Sludge:** Sludge from municipal wastewater treatment plants
6. **Kitchen Waste:** Leftover food scraps and organic waste from kitchens.
7. **Municipal Solid Waste:** Biodegradable fraction of municipal solid waste (e.g., paper, cardboard, food waste).

The biogas primarily consists of methane (CH_4) and carbon dioxide (CO_2), with traces of other gases like hydrogen sulfide (H_2S) and water vapor.

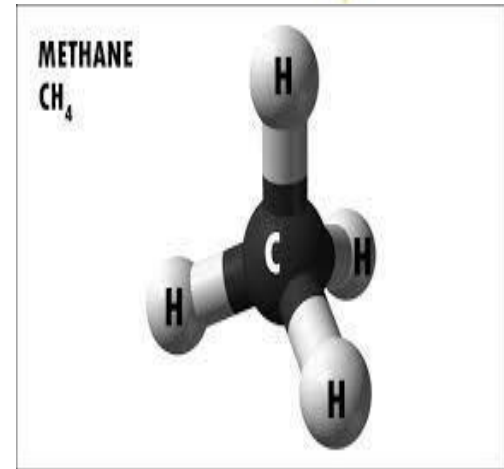


CBG SPECIFICATION



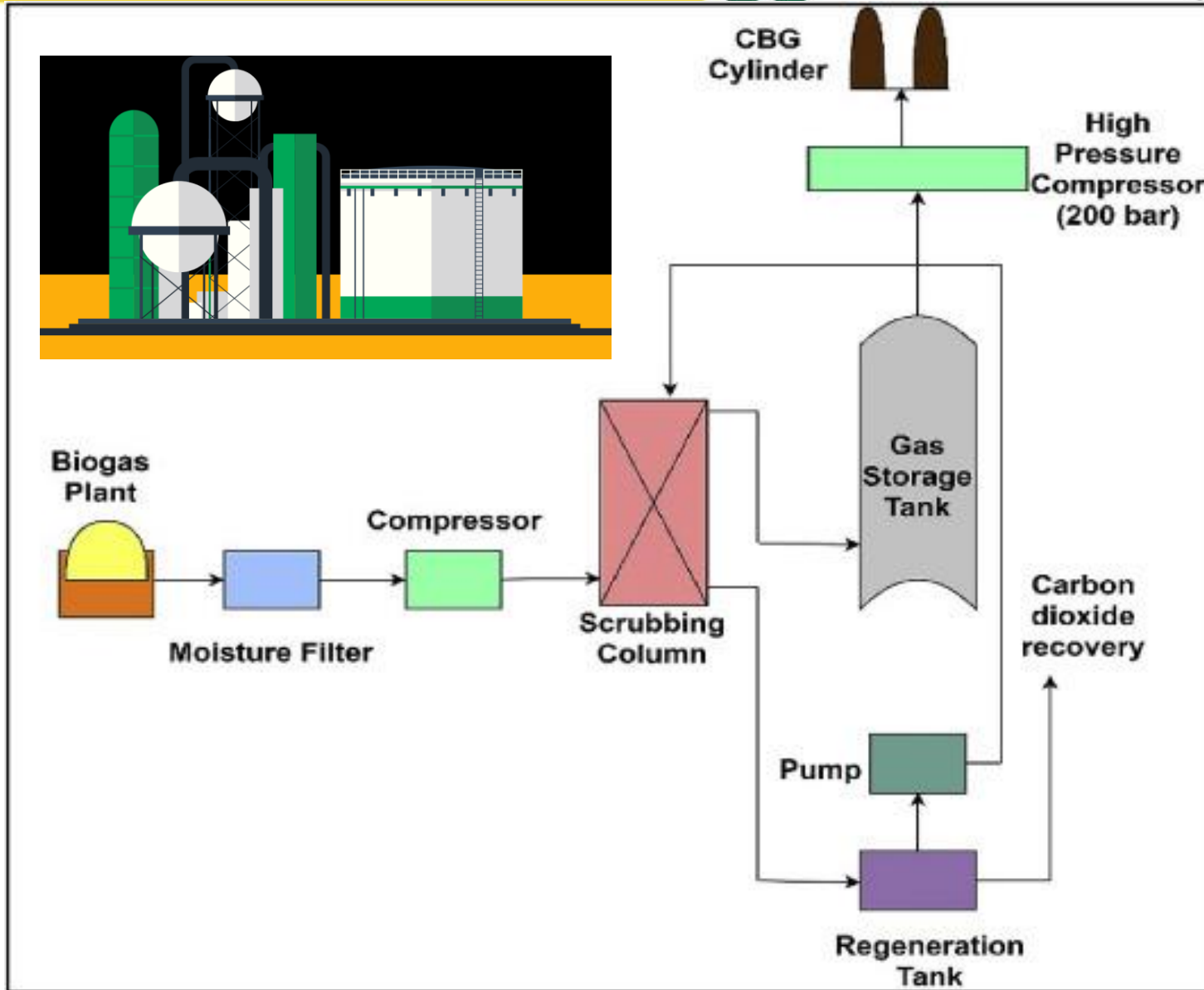
As per IS 16087:2016 specifications, the following shall be met:

- 1) CBG shall be free from liquids over the entire range of temperature and pressure encountered in storage and dispensing system.
- 2) The CBG shall be free from particulate matter such as dirt, dust, etc.
- 3) CBG delivered shall be odorized similar to a level found in local distribution (ref. IS 15319)



SPECIFICATIONS		
	CBG	CNG
COMPONENTS	IS 16087	IS 15958
CH4	MIN 90%	MIN 90%
O2	0.5	0.5
CO2	MAX 4%	NO MENTION
CO2+N2+O2	MAX 10%	MAX 4%
MOISTURE	MAX 5 MG/M3	MAX 5 MG/M3
TOTAL SULPHUR (including H2S)	MAX 20 MG/M3	MAX 20 MG/M3
*DEW POINT SPECIFIED AS Water Dew Point** (°Celsius), max. 0		

CBG SCHEMATIC



CBG-CGD SYNCHRONIZATION SCHEME



- MoP&NG in furtherance of guidelines dated 03.02.2014 and 20.08.2014, has issued policy guidelines dated 09.04.2021, 26.10.2021 and 6.5.2022 (as amended) for synchronization of CBG produced by plants in the CGD network.
- GAIL has been mandated to operationalize the scheme and supply Biogas/CBG co-mingled with pooled natural gas at Uniform Base Price (UBP) across all CGD entities for CNG (T) and PNG (D) segments of CGD network.

Biogas delivered in P/L of CGD entity



CBG delivered at ROs of CGD entity



CBG POTENTIAL IN INDIA



- The country currently imports nearly 77% of its crude oil requirements and about 46% of natural gas requirement, leading the Government of India to set a target of reducing this import by at least 10%.
- Further, it has set a target of increasing the contribution of gas in India's energy mix from existing 6.5% (global average is 23.5%) to 15% by 2030
- The estimated CBG potential from various sources in India is nearly 62 MMT with bio-manure generation capacity of 370 MMT. CBG is envisaged to be produced from various bio-mass / waste sources including agricultural residue, municipal solid waste, sugarcane press mud, distillery spent wash, cattle dung and sewage treatment plant waste.



An initiative by Ministry of Petroleum and Natural Gas (MoPNG)

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SATAT Highlights

Active LOIs

2061

Plants Commissioned

68

CBG Quantity Sold in FY 2023-24

22097 Tonnes

GOVT SCHEME : SATAT



Ministry of Petroleum and
Natural Gas
Government of India



- SATAT (Sustainable Alternative Towards Affordable Transportation) scheme on Compressed Bio Gas (CBG) was launched by Hon'ble Minister, Petroleum & Natural Gas on 1.10.2018.
- The scheme envisages to target production of 15 MMT/annum (metric million tons) of CBG by 2030, from 5000 Plants.
- Four pillars of SATAT are **energy access**, **energy efficiency**, **energy sustainability** and **energy security**.
- The major objectives of the SATAT Scheme are
 - to promote the use of compressed biogas as an alternative fuel,
 - reduce dependency on imported petroleum,
 - provide additional revenue sources to farmers,
 - and contribute to a cleaner environment

Row Labels	Commissioned project (Nos.)
BPCL	8
GAIL	10
HPCL	7
IGL	6
IOCL	31
Grand Total	62



- 1. Central Financial Assistance from Ministry of New & Renewable Energy** has created a portal - <https://biourja.mnre.gov.in/> vide which application can be submitted to obtain Central Financial Assistance for CBG Plants. For plants under BioCNG generation CFA of Rs 4.0 cr per 4800kg/day (1MWeq) can be availed. However Maximum CFA shall be Rs.10 Crore/project.
- 2. Long term offtake agreement by OGMCS (10 to 15 years)** for purchase of CBG at an assured price.
- 3. Synchronization scheme** has been extended for a period of 10 years post 08.04.2024. GAIL purchases Biogas/CBG from producers and sells to CGD entities across India along with APM/NAPM gas at Uniform Base Price (UBP) for use in PNG(D) & CNG (T) segments.
- 4. Inclusion of Compressed Bio Gas (CBG) under Priority Sector Lending** : RBI has notified inclusion of CBG projects under Priority Sector Lending vide directives to Banks dated 04.09.2020.
- 5. Guidelines on Market Development Assistance of Fermented Organic Manure vide Office Memorandum dtd. 20.09.2023. MDA of INR 1500/MT** will be provided for the sale of FOM/LFOM/PROM produced at Biogas plant established under **GOBAR-Dhan** initiative. Registration on portal is a pre-requisite condition. Marketing through FMC or Manufacturers shall be covered under this scheme.
- 6. Loan without Collateral** : For extending credit facilities with collateral security for this product, guidelines issued by credit policy & MSME dept Circular No. 1396/2018 dt 15.11.2018 & 1297/2018 dt 31.08.2018 regarding Credit Guarantee Fund Scheme for Micro And Small Enterprises (CGTMSE) & updation on CGTMSE guidelines from time to time to be adhered.
7. Additionally, PSUs have been **mandated for setting up JVs for CBG plants** to fulfill the CBG blending obligation.
- 8. LOW TAXES i.e. GST 5%.**

SATAT PRICING POLICY ANNOUNCED IN MAY 2022



S No	Lower Retail Selling Price of CBG in Slab	Higher Retail Selling Price of CBG in Slab	Average of Slab	Procurement price of CBG @80% of average of slab	Procurement price of CBG @80% of average of slab	Cost & Margin for OGC @20% of average of slab	Cost & Margin for OGC @20% of average of slab
	including tax	including tax	including tax	Without GST	With GST	Without GST	With GST
	Rs./kg	Rs./kg	Rs./kg	Rs./kg	Rs./kg	Rs./kg	Rs./kg
1	Upto 70		-	54.00	56.70	-	-
2	70.01	75.00	72.51	55.25	58.01	13.81	14.50
3	75.01	80.00	77.51	59.06	62.01	14.76	15.50
4	80.01	85.00	82.51	62.86	66.01	15.72	16.50
5	85.01	90.00	87.51	66.67	70.01	16.67	17.50
6	90.01	95.00	92.51	70.48	74.01	17.62	18.50
7	95.01	100.00	97.51	74.29	78.01	18.57	19.50
One way distance of CBG plant to retail outlet/Selling point				Additional transportation cost of CBG (in Rs./kg)- without GST			
Above 75 kms- upto 100 kms				5.0			
Above 100 kms- upto 125 kms				6.4			
Above 125 kms- upto 150 kms				7.8			

If there is a drop in CNG RSP below Rs. 70/- per kg, the Industry level committee may review the minimum procurement price of Rs. 54/- per kg & implement accordingly.

SNAPSHOT OF PROCUREMENT PRICE UNDER SYNCHRONIZATION SCHEME



COMMODITY	DELIVERY POINT	MODE OF TRANSPORTATION BY CBG PRODUCER	BASIC PURCHASE PRICE	ADDITIONAL CHARGES
CBG	RO OF CGD ENTITY	THROUGH CASCADE	1290/MMBTU	PLUS INR 8/KG (FOR TRANSPORTATION UPTO 75 KMS)
BIOGAS	NEAREST PIPELINE INFRA	THROUGH TIE-IN PIPELINE	1290/MMBTU	PLUS INR 2/KG



- Financial assistance, although limited, supported the midstream activities in the biogas value chain. Uncertain supply of feedstock at affordable prices.
- Non-segregation of municipal solid waste,
- High project Cost
- Less demand/awareness of organic fertilizers from agriculture (by-product of CBG Plant)

- Biogas use in the country could not take off due to a lack of policy clarity and support at the upstream and downstream levels.

- The lack of **guaranteed offtake was** one of the key reasons for the slow performance of the Sustainable Alternative Towards Affordable Transport (SATAT) scheme, which aimed to set up 5,000 CBG plants to provide cleaner and affordable fuel.

CBG BLENDING OBLIGATION



1. In November, 2023, it was mandated to blend compressed biogas in compressed natural gas (CNG) and piped natural gas (PNG) in a phased manner.
2. CBG blending obligation (CBO) would be voluntary till the financial year 2024-25 (FY25),
3. While mandatory blending obligation would start from FY26. CBO will be kept as 1 percent, 3 percent and 4 percent of total CNG (T)/PNG (D) consumption for FY26, FY27 and FY28, respectively.
4. From 2028-29 onward, CBO will be 5%.



IGL STAND ON CBG



S.No.	DESCRIPTION	TOTAL NO.
1	TOTAL OPERATIONAL CBG PLANTS	06
2	LOI ISSUED	19

Sr.	District	LOI Holder's Company Name	Contracted Quantity (TPD)	Actual Production (TPD)
1	Muzaffarnagar	PS GREENGAS	4.5	2.0
2	Muzaffarnagar	GIRVAR & SONS	3.5	3.47
3	Hapur	MITTAL ENTERPRISES	3.5	1.8
4	Muzaffarnagar	BIOSPARK ENERGY PVT LTD.	4.5	3.3
5	Muzaffarnagar	ANAND MANGAL INFRA DEVELOPERS	4.5	3.6
6	Karnal	RAMA GREEN	4.5	1.8
Total			25	15.97

IGL aims to set up 10 CBG (JV) plants by FY2025-26.

List of Parties empaneled for setting up CBG Plants

1. Ever Enviro
2. CEID Consultants
3. GPS Renewables
4. Hindustan Waste Treatment

COMMISSIONED PLANT NO. 1: P.S.GREENGAS IN MARCH 2022



LOI Holder Company Name	District	Offtake Model	Feedstock Processing Capacity	Designed CBG Production Capacity	Avg CBG production OCT 23 (TPD)	Difference in CBG production OCT23 (TPD)	Avg CBG production NOV 23(TPD)	Difference in CBG production NOV 23 (TPD)	Reason for under capacity of CBG production
PS GREENGAS	Muzaffarnagar	IGL has installed LCV filling facility	140	5.6	1	4.6	2.6	3	Issue with Feedstock quantity and quality.

COMMISSIONED PLANT No. 2 - MITTAL ENTERPRISES IN JANUARY 2023



LOI Holder Company Name	District	Offtake Model	Feedstock Processing Capacity	Designed CBG Production Capacity	Avg CBG production OCT 23(TPD)	Difference in CBG production OCT23 (TPD)	Avg CBG production NOV 23(TPD)	Difference in CBG production NOV 23 (TPD)	Reason for under capacity of CBG production
MITTAL ENTERPRISES	Hapur	IGL has installed LCV filling facility	160	6.4	1.5	4.9	1.5	4.9	issue with Feedstock quantity and quality.

COMMISSIONED PLANT NO. 3: GIRVAR & SONS IN JUNE 2023



LOI Holder Company Name	District	Offtake Model	Feedstock Processing Capacity	Designed CBG Production Capacity	Avg CBG production OCT 23(TPD)	Difference in CBG production OCT23 (TPD)	Avg CBG production NOV 23(TPD)	Difference in CBG production NOV 23 (TPD)	Reason for under capacity of CBG production
GIRVAR & SONS	Muzaffarnagar	Supply @250 bars by producer using cascades	125	5	3	2	3	2	Has stabilized at 3TPD production. Supplying quantities to GAIL gas and IGL both

COMMISSIONED PLANT NO. 4: BIOSPARK ENERGY PVT LTD IN OCTOBER 2023



LOI Holder Company Name	District	Offtake Model	Feedstock Processing Capacity	Designed CBG Production Capacity	Avg CBG production OCT 23(TPD)	Difference in CBG production OCT23 (TPD)	Avg CBG production NOV 23(TPD)	Difference in CBG production NOV 23 (TPD)	Reason for under capacity of CBG production
BIOSPARK ENERGY PVT LTD.	Muzaffarnagar	Insertion in MDPE pipeline ~4 bar	100	4	1.7	2.3	1.7	2.3	issue with Feedstock quantity and quality.

COMMISSIONED PLANT NO. 5: ANANDMANGAL INFRA DEVELOPERS PVT LTD IN NOVEMBER 2023

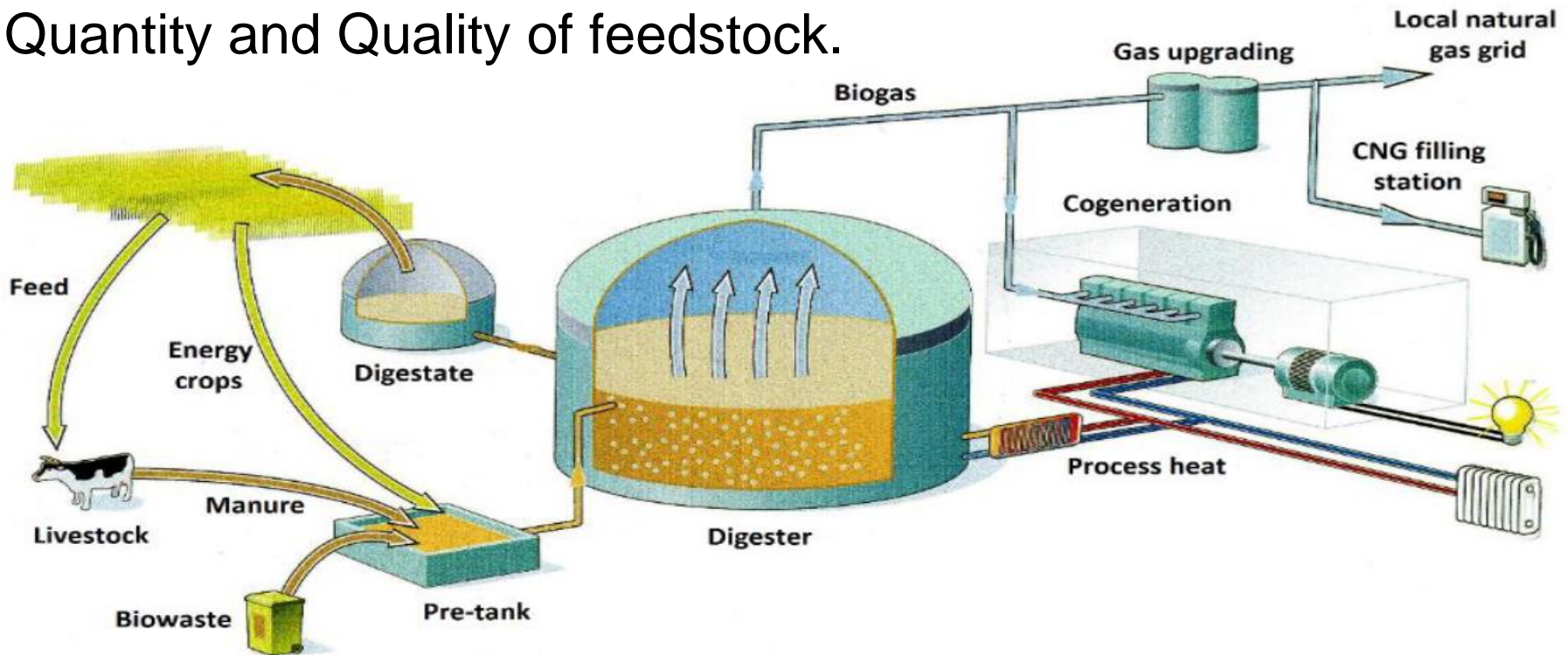


LOI Holder Company Name	District	Offtake Model	Feedstock Processing Capacity	Designed CBG Production Capacity	Avg CBG production OCT 23(TPD)	Difference in CBG production OCT23 (TPD)	Avg CBG production NOV 23(TPD)	Difference in CBG production NOV 23 (TPD)	Reason for under capacity of CBG production
ANAND MANGAL INFRA DEVELOPERS	Muzaffarnagar	Supply @250 bars by producer using cascades	125	5	0.8	4.2	1.2	3.8	issue with Feedstock quantity and quality.

CHALLENGES



- Technological advancement to increase the yield
- Offtake mechanism for CBG and Bio-Manure.
- Quantity and Quality of feedstock.



WAY FORWARD : INDIA



MANDATORY BLENDING (CBO)

- MoPNG has introduced the CBG Blending Obligation (CBO), which may revolutionize the usage and adoption of CBG, marking a significant step towards substituting Liquefied Natural Gas (LNG) imports and achieving a circular economy.

FAIR OFF-TAKE PRICING

CLUSTER ALLOCATION

FINANCIAL ASSISTANCE FOR PROCUREMENT OF BIOMASS AGGREGATION MACHINERY,

PIPELINE INFRASTRUCTURE DEVELOPMENT,

LONG TERM COMMITMENT – TILL 2034



ABOVE INITIATIVES SHALL ENSURE MIN. 12% CAGR OF CBG INDUSTRY IN INDIA TILL 2030 AND BEYOND...



THANK YOU