

BioCNG: The Clean Fuel Championing Climate Action and Economic Growth

Few years back, the Kaira District Co-operative Milk Producers Union Limited popularly known as Amul Dairy became the first in India's food industry to start a fully automated bio-CNG generation and bottling plant to utilize energy from its plant's waste. After tasting success with its BioCNG pilot project in Banas Dairy, Gujarat, Amul is now looking at four more such new plants in Banaskantha with an investment of ₹230 crore. The implementation of bioCNG projects by Amul will establish a paradigm shift towards a circular economy.

BioCNG: BioCNG, also known as biomethane, is a renewable and clean-burning transportation fuel produced by upgrading biogas to natural gas quality. It's essentially purified biogas, made from organic waste materials like:

- Agricultural waste: Crop residues, straw, manure
- Food Waste: Spoiled food, leftover scraps
- Sewage sludge: Solid waste from wastewater treatment plants

Benefits of BioCNG:

- **High Calorific Value:** BioCNG has a high calorific value, which means it can produce more energy per unit volume than other fuels. This makes it more efficient and economical for various applications, such as vehicle fuel, power generation, heating, and cooking.
 - BioCNG can also replace liquefied petroleum gas (LPG), which has a lower calorific value and is more expensive.
- **Clean Fuel:** BioCNG is a clean fuel, as it helps in controlling air pollution. It emits less carbon monoxide, nitrogen oxides, and particulate matter than gasoline or diesel.
 - These pollutants are harmful to human health and the environment, as they cause respiratory problems, acid rain, smog, and climate change.
 - **No Residue or Smoke:** BioCNG does not produce any residue or smoke, which makes it a non-polluting fuel. It does not leave behind any ash, tar, or carbon deposits, which can damage the engine and reduce its performance.
 - BioCNG is therefore a safer and cleaner fuel than other conventional fuels.

- **Economical:** BioCNG is economical, as it can be produced locally from waste materials.
 - This can help in saving transportation and storage costs, as well as creating local jobs and income opportunities.
 - BioCNG can also reduce the energy import bill, as India imports about 85% of its crude oil requirement.
 - BioCNG can also be used as a cooking fuel in residential and commercial kitchens, as it is cheaper and cleaner than LPG.
- **Bio-Fertilizers:** BioCNG can also generate bio-fertilizers, which can improve soil quality and crop yield. Bio-fertilizers are organic fertilizers that contain beneficial microorganisms, such as bacteria, fungi, and algae, that enhance the nutrient availability and uptake by plants.
 - Bio-fertilizers can be produced from the slurry or digestate that is left behind after the production of BioCNG.

Government's Vision for BioCNG:

- **CBG Blending Obligation (CBO):** The government announced a phased mandatory blending of Compressed Bio-Gas (CBG) in Compressed Natural Gas (CNG) and Piped Natural Gas (PNG) segments of the City Gas Distribution (CGD) sector in October 2023.
 - CBG Blending Obligation (CBO) will promote production and consumption of Compressed Bio-Gas in the country.
 - Five per cent blending of biogas with natural gas will reduce LNG import USD 1.17 billion.
- The CBO will be voluntary till FY25 and mandatory blending obligation would start from FY26.
 - CBO shall be kept as 1%, 3% and 4% of total CNG/PNG consumption for FY26, 2026- 27 and 2027-28 respectively.
 - From 2028-29 onwards CBO will be 5%.
- The National Biofuels Coordination Committee (NBCC) is responsible for overseeing the implementation of the mandate
- The Ministry of Petroleum and Natural Gas (MoPNG) will provide financial assistance and other support to CGD companies
- CGD companies will be responsible for blending CBG in their CNG and PNG networks

Key Challenges for CBG Blending Obligation:

- **Availability of Feedstock:** This challenge involves ensuring a steady and sufficient supply of raw materials for CBG production, which may vary depending on the season, region, and market conditions. The cost of feedstock may also affect the profitability and viability of CBG projects.
 - The government has announced various incentives and subsidies for feedstock procurement under the SATAT scheme, but there are issues of implementation and monitoring at the ground level.

- Lack of Adequate Infrastructure and Technology: Developing and deploying the necessary equipment and facilities for CBG production, such as biogas digesters, compressors, purifiers, etc poses a significant challenge.
 - Creating and maintaining the infrastructure for CBG storage, transportation and distribution, such as pipelines, cylinders, dispensers, etc is also a challenge.
 - The government has invited bids from entrepreneurs and investors to set up CBG plants under the SATAT scheme, but there are barriers of entry and exit, such as high capital costs, regulatory hurdles, technical glitches, etc.
- Coordination and Cooperation among Various Stakeholders: Fostering a conducive and collaborative environment among the various actors involved in the CBG value chain, such as farmers, entrepreneurs, investors, regulators, consumers, etc creates hurdle.
 - It also involves ensuring transparency and accountability among the stakeholders, such as compliance with quality standards, pricing mechanisms, contractual obligations, etc.
 - The government has established a Central Repository Body (CRB) to monitor and implement the blending mandate, but there may be issues of coordination and communication among the stakeholders, such as conflicts of interest, information asymmetry, etc.
- Awareness and Acceptance of CBG as a viable Alternative: The government has launched various campaigns and initiatives to educate and encourage the public and the industry to adopt CBG, such as the Go Green campaign, the CBG logo, etc., but there may be issues of perception and preference among the consumers, such as lack of trust, inertia, resistance to change, etc.

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