



BIOGAS FORUM - INDIA (BiGFIN)



E-Newsletter

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From the Editorial Desk

Prof. Virendra Kumar Vijay
IREDA Chair Professor,
Center for Rural Development and Technology, IIT Delhi



Warm greetings to all BiGFIN members and readers.

I am pleased to reach out to you with the latest newsletter after two long years because of unprecedented COVID-19.

Biogas technology has the potential to make sustainable development, particularly in rural and semi-urban areas. Biogas technology is a boon for Indian farmers with direct and indirect collateral benefits. It is one of the best models of circular economy for rural India. The Ministry of New and Renewable Energy has been vigorously pursuing the implementation and promotion of biogas technology for the past few decades. India has much favorable environment in terms of optimal temperature, high cattle population, and strong agricultural economy for dissemination of biogas on larger scale, however the success of the biogas programme is still not as per expectation.

The biogas sector in India has witnessed significant growth in recent years. The government of India is pursuing sustainable energy through regulation and financial support encourages the use of biogas at all levels, including residential and commercial uses. GOBARdhan initiative of the Union Government working towards Waste-to-Wealth promoting circular economy and the scheme has started stimulating investment and reaping good results by creating an ecosystem for Compressed Biogas (CBG). The enthusiasm and response received by the investors for compressed biogas plants on the Unified Registration Portal for GOBARdhan shows that the market is ready to take the biogas sector ahead. SATAT, a scheme launched to boost compressed biogas (CBG) production in India intends to mandate the natural gas market to sell biomethane. The very recent mandate by the Government of India to blend compressed biogas in CNG and PNG in a phased manner, i.e. voluntarily until the fiscal year FY 2024-25 and later mandatory blending from FY 2025-26 onwards has provided a boost to the biogas market. It is evident that the biogas sector in India is poised for growth and will play a significant role in the energy mix of India's renewable energy portfolio.

This issue of the Newsletter showcases the recent developments in the biogas sector nationally and worldwide. New research and development in biogas is also presented in this issue. We hope that you find this special issue interesting and inspiring. We also welcome innovative ideas and inputs contributing to the growth of this sector.

Prof. Virendra Kumar Vijay
General Secretary, Biogas Forum India (BigFIN)
Professor, CRDT, IIT Delhi

President's Column



Dr. Neeraj Sinha
Senior Adviser (Science & Technology)
NITI Aayog, New Delhi

India is the third-largest consumer of electricity in the world and the fourth-largest producer of renewable energy. The year 2022 witnessed the installation of about 40% of the energy capacity (160 GW of 400 GW) using renewable energy sources, show-casing the country's commitment to implement sustainable renewable energy technologies / projects. The country has set an enhanced target – of 500 GW of non-fossil fuel-based energy by 2030 – during the meeting of the Conference of Parties (COP26), held in Glasgow in the year 2021.

As per the available data, India has installed over 800 biogas power projects, bagasse cogeneration and non-bagasse cogeneration projects, with an aggregate capacity of 10632 MW for power generation and 140 tonnes per day for compressed biogas (CBG) production. In a major step towards increasing the share of CBG in the mainstream energy market, the Ministry of Petroleum and Natural Gas has recently announced the phase-wise mandatory blending of CBG in the compressed natural gas (Transport) and the piped natural gas (Domestic) segments. This is expected to bring about a transformational change in the biogas sector.

Despite the efforts on various fronts, there is still an emergent need for action at different levels – such as capacity building and training, infrastructure development, revision in the central financial assistance for the north-eastern states, focus on SC & ST category beneficiaries for small biogas plants, registered gaushalas, public-private partnership, research & development and awareness. The successful implementation of the biogas programme will depend on long term planning, involving the central & the state government agencies, the non-governmental organizations, the private sector and the public sector.

I hope that our esteemed readers will find this edition both interesting and useful. I will eagerly look forward to their valuable feedback.

Dr. Neeraj Sinha
Senior Adviser (Science & Technology)
NITI Aayog, New Delhi

Last one-year activities in CRDT, IIT Delhi

1. Prof. V. K. Vijay exchanged MoU with UPNEDA for collaboration on Bioenergy project in UP

On November 4, 2022, at the Hotel Taj Lucknow, a MoU was exchanged between IIT Delhi and Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA), Government of Uttar Pradesh for collaboration on Bioenergy Projects for mentoring and Inspection in UP under Bioenergy Policy- 2022. Professor V. K. Vijay, Centre for Rural Development and Technology (CRDT), Indian Institute of Technology New Delhi and Shri. Anupam Shukla, Director, UPNEDA exchanged the MoU during the RE conclave on Renewable Energy - Opportunities in Uttar Pradesh. Shri. A. K. Sharma, Hon'ble Cabinet Minister of Energy, UP Govt and Shri. Somendra Tomar, MoS UP Govt, were present during the event.

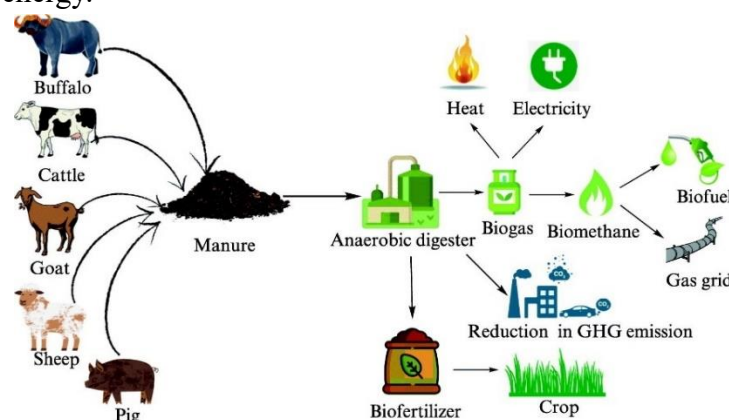


Source: ([See More](#))

Recent Research Articles

1. Estimation of renewable biogas energy potential from livestock manure: A case study of India

The research article published on a case study of rural Haryana in India on biomass resources potential from animal manure and mitigate greenhouse gas emissions. It reports that the state has the potential of 52.29 million tons of livestock dung which generates a biogas of 5464.11 million m³ and electrical energy of 9835.4 GWh annually and biofertilizer potential of 6.78 million tons/year. The biomass resource distribution, power density, and electricity per-capita potential of livestock manure are projected to be 27.41 kton/km², 0.59 W/m², and 387.96 kWh/capita respectively. Biomass power generation leads to an estimated saving of 1707.08 to 3583.73 million kg/year, with a baseline headline of 2560.32 million kg/year CO₂ emissions, from transition to local livestock biomass in place of diesel for power. These findings can assist policy planners in decentralized bioenergy generation and map emission profiles with bioenergy.



Read more: ([Click here....](#)), Published on June 2023

2. Promoting energy and resource recovery from livestock waste: Case study Yuge Farm, Japan

A case study published on biogasification system operating under fed-batch conditions on the Yuge Farm in Kobe, Japan, is a prime example of appropriate agricultural waste management for resource recovery, encouraging circularity, and maintaining environmental health. Currently, the two digesters on the farm supply 2400 m³ of biogas from dairy cow dung, dairy by-products, and food waste are operating. However, amendments to substrates can increase biogas production to 13,166.01 m³ per year with an electrical energy potential of 2843.20 kWh/year, contrary to the current output of 518.28 kWh/year, consequently displacing fossil fuel-based electricity. Furthermore, greenhouse gas emissions from dairy cow manure management are equivalent to 7051.35 kgCO₂e/year, with current avoided grid emissions amounting to 241.14 kgCO₂e/kWh/year. However, the proposed scenario increases it to 1324.36 kgCO₂e/kWh/yr. The report indicates that the model is appropriate for global adaptation to improve manure management, as collected residues are appropriate for enhancing electricity generation, reducing emissions, and redesigning small-scale animal husbandry for long-lasting stability.

Read more: ([Click here....](#)), Published on June 2023

3. Anaerobic digestion as a sustainable technology for efficiently utilizing biomass in the context of carbon neutrality and circular economy

The research article provides an overall context about role of anaerobic digestion (AD) in achieving carbon neutrality, circular economy, waste management and its importance in renewable energy sectors. The AD technology recovers the volatile matter from waste biomass as much as possible to produce biogas, thus reducing carbon emission as compared to open dumping or burning. The article aims to clarify the associated internal and external factors that determine the low carbon characteristic of anaerobic digestion technology. It explores the potential of AD system for energy-atmosphere-agriculture nexus. A case scenario of India was assessed considering the utilization of major surplus biomass available through AD. Re-routing the three major substrates such as agricultural crop residues, animal wastes and organic fraction of municipal solid wastes through AD can reduce at least 3.5–3.8 kg CO₂-eq per capita of annual carbon emission load in India. Furthermore, the pathways in which the policy and legislations over establishment of AD technology and how to explore linkages between achieving circular economy and low carbon economy for Indian scenario has been highlighted.

Read more: ([Click here...](#)) Published on October 2023

4. Use of regression models for development of a simple and effective biogas decision-support tool

It is important to increase the efficiency of AD performance, accurate prediction of biogas yield in different working conditions. The present study reports a development of regression models to estimate biogas production from co-digesting swine manure (SM) and waste kitchen oil (WKO) at mesophilic temperatures. A dataset was collected from the semi-continuous AD studies across nine treatments of SM and WKO, evaluated at 30, 35 and 40 °C. Application of polynomial regression models and variable interactions with the selected data resulted in an adjusted R² value of 0.9656, much higher than the simple linear regression model (R² = 0.7167). The significance of the model was observed with the mean absolute percentage error score of 4.16%. Biogas estimation using the final model resulted in a difference between predicted and actual values from 0.2 to 6.7%, except for one treatment which was 9.8% different than observed. A spreadsheet was created to estimate biogas production and other operational factors using substrate loading rates and temperature settings. This user-friendly program could be used as a decision-support tool to provide recommendations for some working conditions and estimation of the biogas yield under different scenarios.

Read more: ([Click here...](#)), Published on March 2023

5. Biogas purification processes: review and prospects

The upgradation of biogas is hot topic in bioenergy sector. The article reviews the recent development on biogas purification processes. Biogas is mainly composed of 60–70% methane, 30–40% carbon dioxide, and hydrogen sulfide <1%. Pure CH₄ generates approximately 30.67 to 36.68 MJ m⁻³ or 10 Kw m⁻³ of energy, being able to compete with conventional fuels. The purified biogas could be a competitive biofuel with conventional fuels. Currently, there are many physical, chemical, and biological biogas upgrading

methods; efficient, promising, and yield greater than 90% of recovered CH₄. The biogas upgrading requires expensive infrastructure and chemical reagents and generates by-products that can cause long-term environmental problems. For this reason, purification methods must be comprehensive and should contribute to improving the purity of CH₄ from biogas. This study reviewed the most relevant methods, the operating conditions to remove CO₂ and H₂S, as well as the advantages and disadvantages of biogas purification processes.
Read more: ([Click here....](#)), [Published on Jun 2023](#)

6. A Quantitative Examination of the Efficiency of a Biogas-Based Cooling System in Rural Regions

This study investigates the efficiency of a biogas-powered cooling system through the utilization of energy and exergy calculations. Biogas, which can be generated and stored in small-scale plants as needed, serves as a viable fuel source for absorption cooling systems. This article focuses on the biogas consumption of a triple-effect absorption cooling system specifically designed to supply a fixed cooling load of 100 kW under varying operational conditions. The study explores the establishment of dedicated farms for various animal species, ensuring an adequate number of animals for biogas production. The findings reveal a coefficient of performance of 1.78 and an exergetic coefficient of performance of 35.4% at the optimized operating temperatures. The minimum mass flow rate of biogas is determined to be 0.0034 kgs⁻¹, facilitating the operation of the boiler with a methane content of 65%. This study concludes that a total of 290 head of cattle is required to generate the annual biogas consumption necessary for the cooling system. Additionally, the number of the cattle is enough to establish 284 biogas plants in Bursa Province in Türkiye.

Read more: ([Click here....](#)), [Published on June 2023](#)

7. Multidisciplinary Pretreatment Approaches to Improve the Bio-methane Production from Lignocellulosic Biomass

Natural recalcitrance of lignocellulosic biomass pertaining to the intricate network of polysaccharides and lignin, high crystallinity of cellulose, and reduced accessible surface area are some of the major bottlenecks to utilizing these resources as received. Pretreatment helps open up the plant cell wall by disrupting the lignin carbohydrate complex, delignifying the biomass, aiding the enzymes to access the polysaccharides due to higher surface area efficiently, and hydrolyze them into simple sugars with the help of bacterial consortium during AD process. The articles give an overview of physical, chemical, biological, and combinatorial pretreatment methods of lignocellulosic substrates and their effect on AD process. Biological pretreatment has emerged as a more desirable pretreatment method in terms of environment safety and efficiency for lignin degradation. Though the higher pretreatment duration has been observed as the most significant challenge that need to be addressed for its adoption on commercial scale. Therefore, research is required to either explore the naturally occurring or prepare the genetically engineered microbes for selective degradation of lignin at faster rates and high tolerance for variation in environment factors.

Read more: ([Click here....](#)), [Published on 23 July 2022](#)

8. Gender and Water-Energy-Food Nexus in the Rural Highlands of Ethiopia: Where Are the Trade-Offs?

Modern bioenergy alternatives is promoted to address water–energy–food (WEF) security in the rural highlands of Ethiopia. While the role of women in WEF security is an essential component of these challenges, gender dimensions remain invisible in the nexus debate. This study explores the impact of gender-specific roles between female- and male-headed households on the nexus resources in the rural highlands of Ethiopia using an agent-based modeling approach. Using the participatory gendered mental model of the food–energy–land nexus, a base ABM was developed to simulate the predicted effects under scenarios of population growth and labor reallocation. Initial simulation results show that there is low adoption of alternative bioenergy (i.e., biogas digesters), and the majority remain dependent on traditional energy sources (e.g., fuel wood and animal dung), suggesting further land degradation. Female-headed households that adopt biogas increase their burden of collecting water needed for the operation. Reallocation of labor from crop production to fuelwood collection would result in the reduction of crop yields.

Read more: ([Click here....](#)), Published on 28 February 2023

9. Location and specialization indicators of animal bioenergetic potential in Paraíba (Brazil)

Several international forums have been discussing energy insecurity in the world caused by dependence on oil and natural gas, as well as their consequent economic instabilities and environmental crises. In order to increase the energy matrix in both the developing and developed regions of the world and meet global goals, there is a motivation in the growing use of bioenergy, as an alternative to fossil fuels, which can increase energy security and provide a possible reduction in emissions of CO₂. This study analyzed the pattern of location and specialization of the energy potential of livestock waste in the municipalities, in the immediate and intermediate regions of the Paraíba state (Brazil) from 2000 to 2020. The results showed that the Paraíba state can produce on average about 31.3 PJ of animal bioenergy each year. The immediate region of Campina Grande has the highest average annual energy, with around 7.38 PJ. In the region of Sumé and Monteiro was concentration of theoretical potential energy (TEP) of goat and sheep.

Read more: ([Click here....](#)), Published on October 2023

10. Technology evaluation for biogas production from animal waste in circular carbon economy: A complex spherical fuzzy set-based decision-making framework

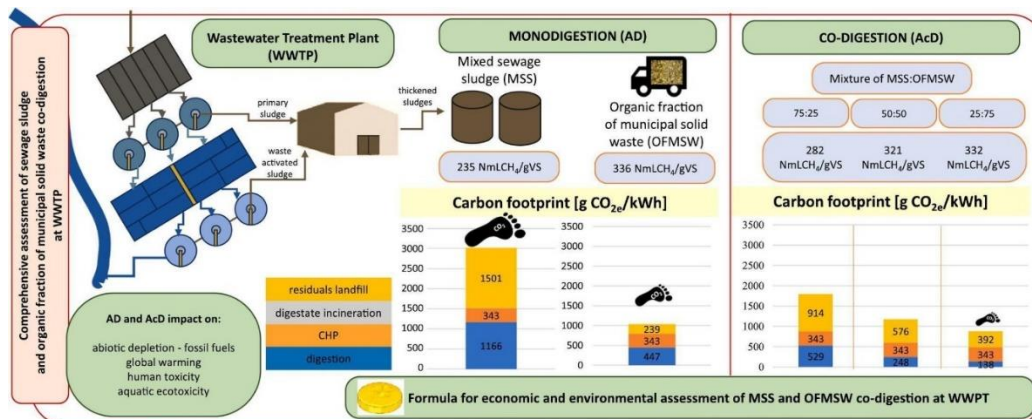
The transition to move towards a circular carbon economy needs for using suitable technologies for clean energy as low-carbon energy like biogas-based energy production, and ensures the growth of a low-carbon economy with regard to environmentally responsible activity in the rural region. The feedstocks of biogas to produce electricity are kindly forestry products, agricultural residues, and animal waste. The biogas production from chicken manure (as animal waste) in the southwest of Iran is taken into consideration. Policies of resilience, sustainability, circularity, and technology assessment are taken into account as assessment principles. For choosing an appropriate biogas production technology, a novel model namely complex spherical fuzzy set (CSFS)-based TOPSIS

(Technique for Order of Preference by Similarity to Ideal Solution) is used. It involves four technologies and the ranking of technologies from the most to least is: Pragati technology, Deenbandhu technology, Janata technology, and Khadi and village industries commission (KVIC) technology.

Read more: ([Click here...](#)), Published on September 2023

11. Life Cycle Assessment of sewage sludge mono-digestion and co-digestion with the organic fraction of municipal solid waste at a wastewater treatment plant

The research article reports a Life Cycle Assessment (LCA) comparing sewage sludge (SS) anaerobic co-digestion (AcD) with the organic fraction of municipal solid waste (OFMSW) at waste water treatment plant against SS anaerobic mono-digestion (AD). The LCA was based on the research showing that methane production related to wet mass in AcD was higher than in AD by 86.4, 225.8, and 354.3 % for SS:OFMSW mixing ratios of 75:25, 50:50, and 25:75, respectively. The LCA was conducted for 1 kWh of biogas energy produced at a WWTP and included two subsystems: energy production (AD/AcD and CHP) and associated digestate management (drying, incineration with energy reuse, residual landfilling). CML-IA baseline 2013 and Recipe 2016 Midpoint (H) LCIA methodologies indicated the environmental impacts on abiotic depletion - fossil fuels (fossil resource scarcity), global warming, human toxicity (non-carcinogenic), freshwater, and marine aquatic ecotoxicity. AD of SS in all categories was characterized by the highest impact. The impact decreased with an increase in the OFMSW rate. Both methodologies showed a significant impact of AD and AcD on global warming, which indicated the need for the determination of the carbon footprint (CF) of 1 kWh biogas energy production ($\text{gCO}_2 \text{ kWh}^{-1}$) at WWTP, using IPCC 2021 GWP100 (incl. CO_2 uptake).



Read more: ([Click here...](#)), Published on December, 2023

Biogas News – National

1. **Compulsory biogas blending in CNG, PNG will help create better biofuel ecosystem**

The oil ministry has mandated blending of compressed biogas in compressed natural gas and piped natural gas, targeting 1 percent blending by financial year 2025-26. The government said the CBG blending obligation (CBO) would be voluntary till financial year 2024-25 (FY25). Compulsory blending of compressed biofuel in compressed natural gas (CNG) and piped natural gas (PNG) will help create a well-structured market for biofuels in India, say industry leaders. Experts are optimistic about the recent move by the oil ministry to mandate blending of compressed biogas (CBG) in CNG and PNG with the target of 1 percent blending by financial year 2025-26. “The recent move by the government would bring down capital and operational expenditure. The process of selling biofuels in the market will become very smooth and the ecosystem will become investor friendly. Since the gas market is governed solely by MoPNG (Ministry of Petroleum and Natural Gas), mandatory blending of biogas would become a reality,” said Gaurav Kedia, Chairman of the Indian Biogas Association. The government said the CBG blending obligation (CBO) would be voluntary till financial year 2024-25 (FY25), and the mandatory blending obligation would start from FY26. CBO will be kept as 1 percent, 3 percent and 4 percent of total CNG/PNG consumption for FY26, FY27 and FY28 respectively, it added.

November 28, 2023, Read More: ([Click here....](#))

1. **Punjab to set up 10 CBG projects**

India's state-owned Punjab Energy Development Agency (PEDA) has signed an agreement with GAIL (India) Limited to set up 10 compressed biogas projects and other new and renewable energy projects in the state. A memorandum of understanding (MoU) was signed by PEDA CEO Amarpal Singh and GAIL (India) Executive Director RK Singhal. The Minister for Punjab New and Renewable Energy Sources (NRES), Aman Arora, said the pact will assist the state in managing five lakh tonnes of paddy straw per annum for clean energy generation. He added the Punjab, as an agrarian state, has enormous potential for crop residue-based compressed biogas plants. NRES Secretary Ravi Bhagat said that with the implementation of these 10 projects, paddy straw in around 1.25 lakh acres is expected to be prevented from being burnt. Singhal said 10 CBG projects will be set up with an investment of about Rs 600 crore, producing 35,000 tonnes of biogas and about 8,700 tonnes of organic manure annually.

November 22, 2023, Read More: ([Click here....](#))

2. **Northeast India inaugurates its first biogas plant**

Assam Chief Minister on February 25, laid the foundation stone for the first-ever compressed biogas plant project in northeast India took place at Domora Pathar in Sonapur. The plant which is being built by businessmen Pankaj Gogoi and Rakesh Doley under the name Redlemon Technologies, will have a 5 tonne per day production capacity for compressed biogas from raw materials like municipal solid wastes and cattle manure. It is expected to start operating in November 2023. CM Sarma said that the Sonapur compressed

biogas facility would greatly help the Assam government achieve its objective of gradually switching to cleaner and more environmentally friendly energy. In addition to assisting with city solid waste management problems, the compressed biogas facilities, like the one being built in Sonapur, would provide farmers with an additional source of income by allowing them to sell animal excrement to the biogas makers. He further added that the organic fertilisers produced as a byproduct of methane in such compressed biogas plants would provide a better substitute for the chemical fertilisers presently used throughout the State.

February 28, 2023, **Read more:** ([Click here....](#))

3. Gruner to set up 100 bio-CNG plant across country in FY 2024

Gruner Renewable Energy (GRE), a start-up in the renewable sector, will set up 100 bio CNG plants across India, with a target turnover of Rs 1,000 crore by the end of this fiscal. Gruner Renewable Energy (GRE), a start-up in the renewable sector, will set up 100 bio CNG plants across India, with a target turnover of Rs 1,000 crore by the end of this fiscal. The company recently collaborated with BioEnergy Germany, a German company that provides technology and engineering design for biomass-based gas plants, and so far it has received 42 project orders to establish biogas plants in the country. “We have so far secured 42 firm contracts for building biogas plants and many more are in the offing,” said Utkarsh Gupta, founder and CEO of Gruner Renewable. India aims to build 5,000 commercial units and create 15 MMT of CBG (Compressed Biogas) by 2024–2025. At the Global Conference on Compressed Biogas (CBG) held in April, petroleum minister Hardeep Singh Puri said India has set a target to increase the share of gas in the energy mix up to 15% by 2030 to transform India into a gas-based. Currently, it imports nearly half the natural gas used in India. Recently, the company announced the first Napier grass bio CNG plant in the country.

August 22, 2023, **Read More:** ([Click here....](#))

4. National Dairy Development Board (NDDB) with Mexican firm to supply 15,000 biogas plants in Gujarat, Maharashtra

The National Dairy Development Board (NDDB) signed an MoU with Mexico-based Sistema Bio on Friday for supplying 15,000 biogas plants to farmers in Surat, Kolhapur and Pune. As per this agreement, farmers owning two or three cows or buffaloes will be given biomass plants at the subsidised rate of Rs 5,990. The actual cost of these plants is around Rs 40,000. The company has made a good model where there is no need to provide any government subsidy. The company will generate carbon credits and use them. The NDDB had partnered with the same private firm for a pilot project at a village in Anand. About 370 households with livestock were given biogas plants. Today each and every one of them is functional and saves Rs 1,200 as these families need not depend on wood or alternative fuels. Anand Agriculture University had undertaken a study that found a 30 per cent rise in crop yield for farmers using the organic fertiliser. During a launching pilot project in Jakhariyapura village, NDDB gave a free biogas plant of 2 cubic metres, which is enough for the cooking and heating needs of a family of four-five members.

February 18, 2023, **Read More:** ([Click here....](#))

5. New investments worth Rs 2,755 crore pledged with Indian Biogas Association

New investments totalling Rs 2,755 crore have been pledged with industry body Indian Biogas Association (IBA) during the recently held Renewable Energy India Expo 2023. Talking to PTI, IBA Chairman Gaurav Kedia said "Indian Biogas Association (IBA), an industry association comprising operators, manufacturers, and planners of bioenergy plants, has received a commitment of investment worth Rs 2,755 crore during the Renewable Energy India Expo 2023." The association has signed joint ventures (JVs), MoUs (memorandum of understanding) and received LoIs (letter of intent) commitments during the recently concluded Renewable Energy India (REI) Expo held at Greater Noida from from October 4 to 6.

October 15, 2023, **Read more:** ([Click here....](#))

6. Sugarcane byproduct pressmud can be a sweet spot for India's compressed biogas sector

The byproduct can help generate 460,000 tonnes of compressed biogas CBG valued at Rs 2,484 crore India has assumed a key position in the worldwide sugar economy, emerging as the foremost sugar producer since 2021-22, surpassing Brazil. Additionally, it stands as the second-largest sugar exporter globally. The expansion of the ethanol biofuel sector over the past five years has not only strengthened the sugar industry but also contributed to the improved financial standing of sugar mills. Pressmud, a residual byproduct in the sugar industry often known as filter cake or press cake, has been acknowledged as a valuable resource for green energy production. The byproduct can help Indian sugar mills generate extra revenue by utilising it as a feedstock for biogas production through anaerobic digestion and subsequent purification to create compressed biogas (CBG).

November 28, 2023, **Read More:** ([Click here....](#))



7. Reliance Industries pursuing sugar mill operators for biomass plant plans

Reliance Industries (RIL), India's most valuable company, is in discussions with sugar mill operators to procure sugarcane press mud—a crucial raw material for producing compressed biogas (CBG), as per an Economic Times report citing internal sources. In a September

announcement, RIL Chairman Mukesh Ambani outlined ambitious plans to establish 100 CBG plants within the next five years. These forthcoming plants are projected to utilise 5.5 million tonnes of agricultural residue and organic waste.

December 07, 2023, **Read more:** ([Click here....](#))

8. MoHUA to lead national Biogas Conference on Dec 1, boosting India's circular economy drive

In a significant step towards promoting circular economy and waste management, the Ministry of Housing and Urban Affairs (MoHUA) is set to organize the 'SBM-GOBARDhan Biogas Conference: Accelerating Waste to Wealth & Circular Economy' on December 1, 2023. The conference, a collaboration with GIZ, circular waste solutions, and UNIDO, aims to bolster the Compressed Biogas (CBG) sector by fostering cross-sectoral linkages and facilitating dialogue among stakeholders. Underlining the Indian government's commitment to transforming waste into wealth, the GOBARDhan initiative is central to this endeavour. It supports the establishment of Biogas/CBG/BioCNG plants as part of India's journey towards net-zero emissions by 2070, in line with its Nationally Determined Contributions (NDC).

November 30, 2023, **Read more:** ([Click here....](#))

9. IEEFA report identifies biogas solutions for India

Institute for Energy Economics and Financial Assessment (IEEFA) published a report on biogas scenario in India. It stated that the government is encouraged to develop the biogas sector by shifting from capital expenditure (CAPEX)-based incentives to generation-based incentives. This will enable robust market development and help India achieve net-zero emissions targets by 2070. There was a recent announcement to set up 500 new Waste-to-Wealth plants under the Galvanising Organic Bio-Agro Resources Dhan (GOBARDhan) scheme. Similarly, the Ministry of Jal Shakti recently launched a unified portal to make registering biogas projects easier. The report said: "We estimate that replacing natural gas consumption with biogas and biomethane incrementally to 20% by 2030 can help India cut liquefied natural gas (LNG) import bills by US\$29 billion between the fiscal year (FY) 2025 and FY2030, taking a compounded annual growth rate of 22% in the natural gas sector and based on the assumption of 550 million standard cubic metres per day (MSCMD) of gas consumption in 2030 and varying import prices for each year based on the Japan Korea Marker price forecasts." However, only 48 compressed biogas plants have become operational under the SATAT scheme, instead of the 5,000 targets.

October 27, 2023, **Read more:** ([Click here....](#))

10. Proposed 5% biogas blending with natural gas can cut LNG imports worth USD 1.17 Billion: IBA

The proposed 5 per cent blending of biogas with natural gas supplies in the country can cut LNG imports worth USD 1.17 billion annually, says a study by the Indian Biogas Association (IBA). The study comes against the backdrop of the government's recent mandate to blend one per cent biogas with piped natural gas (PNG) supplies in the country from April 1, 2025 under the compressed biogas blending obligation (CBO) scheme.

December 4, 2023, **Read more** at: ([Click here....](#))

11. India can reduce fossil fuel dependence, cut import bills by \$29 billion through biogas adoption

The report from the Institute for Energy Economics and Financial Analysis (IEEFA), underscores the environmental advantages of expanding biogas projects, including waste management, reduction of greenhouse gas (GHG) emissions, and enhanced renewable energy production. Replacing natural gas consumption with biogas and biomethane incrementally to 20 per cent by 2030 can help India cut liquefied natural gas import bills by USD 29 billion between financial years 2025 and 2030, according to a new report. Report says biogas has the potential to replace natural gas and other high-emission fossil fuels. Introduction of the GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) scheme as an umbrella initiative of the government will help in this consolidation. It covers the entire gamut of schemes/policies promoting organic waste conversion to biogas or compressed biogas (CBG). The report also highlights recent policy developments, such as revising the compressed biogas rate in response to global gas price increases and plans to mandate natural gas marketing companies to procure five per cent compressed biogas.

October 26, 2023, Read more: ([Click here....](#))

Biogas News – International

1. **European Biogas Association (EBA) reported biomethane production increase by 20% increase in Europe**

The report published by European Biogas Association (EBA) has revealed that biomethane production in Europe grew by almost 20% in 2022 compared to the previous year, according to data from the new edition of the EBA Statistical Report.



Harmen Dekker, EBA's CEO said that sustainable biogases production holds a strategic importance for reducing import dependence, and climate emergencies. "Each Euro invested in biogases will remain in the European economy and provide an additional value of 50% before 2030 that will also stay within our economy." Europe's biogases production (combined biogas and biomethane) in 2022 amounted to 21 bcm which represents 6% of the EU's natural gas consumption in 2022. Biomethane production alone grew from 3.5 bcm in 2021 to 4.2 bcm in 2022. In the case of Denmark, the share of biomethane in the gas grid was close to 40% and there are plans to increase this production to substitute 100% of the gas demand before 2030. The versatility of biomethane as a renewable energy source is reflected in its balanced distribution pattern across end-uses, all in urgent need for decarbonisation: 22% was used for buildings in 2022, whereas a further 14% was used in industry, 19% for transport and 15% for power generation. According to EBA data, Europe produced 31 Mt (DM) of digestate in 2022 and could already cover 15% of EU nitrogen-based fertilisers demand. This could save 10 Mt CO₂ equivalent and 2 bcm of natural gas consumption.

[December 5, 2023, Read More: \(Click here...\)](#)

2. **Japan plans to implement "clean energy" biogas certificates**

The Japan Gas Association (JGA) will issue a clean gas certification to synthetic methane (e-methane) and biogas producers, targeting launch from the April 2024-March 2025 fiscal year. JGA, an association of city gas utilities, has entrusted state-affiliated energy think-tank the Institute of Energy Economic Japan (IEEJ) with the project, and has set up an evaluation committee. Many rural areas do not have access to city gas pipelines. E-methane and biogas production facilities will be set up in such areas, JGA said. JGA will issue the certification to e-methane and biogas producers that meet certification standards, to sell it to gas distributors or their customers, such as factories which need cleaner generating fuels to achieve their decarbonisation goals. The association aims to popularise the certification and make it a national system in the near future, enabling many companies which own e-methane and biogas projects overseas to use it. Researchers and companies which already operate e-methane and biogas production facilities will determine the fair operation of the scheme and its guidelines, the association added.

[August 08, 2023, Read more: \(Click here...\)](#)

3. Biogas in France: TotalEnergies commissions BioBéarn, the country's largest anaerobic digestion unit

In January 2023, TotalEnergies commissioned the BioBéarn biogas production unit in Mourenx in the south-west of France. With an annual production capacity of 160 gigawatt hours (GWh), BioBéarn has reinforced our position as a major biogas player in France and Europe. BioBéarn is TotalEnergies' 18th biogas production unit¹ in France on a 7-hectare former brownfield site in the center of the Lacq basin. The unit will be capable of converting 220,000 tons of organic waste every year from local farming activities and the agri-food industry. The facility has been supplying biomethane to Teréga's natural gas transmission network since January 2023. It will be gradually increased to a maximum output of 160 GWh at 100% capacity, or the annual average consumption of 32,000 inhabitant. BioBéarn is also facilitating local and sustainable growth in the Lacq basin, a historical gas location, by preventing the release of 32,000 tons of CO₂ annually. Finally, as part of a Biomethane Purchase Agreement signed in June 2023, BioBéarn will supply Saint-Gobain France with 100 GWh of biomethane over a three-year period starting in 2024. As such, we are



supporting Saint-Gobain with its efforts to reduce its greenhouse gas emissions in France. After more than 200 farmers and agri-food manufacturers, as well as local residents and elected representatives, worked together to develop BioBéarn, which was started in 2016. This allowed the project to grow and change to meet the needs of the region.

January 12, 2023,

Read More: ([Click here....](#))

4. PepsiCo Portugal invests in €7.5 million biodigester

PepsiCo Portugal has announced that it will invest €7.5 million to construct a new biodigester, which will turn organic waste into biogas reflecting its commitment to sustainability and the reduction of carbon emissions at its snack factory in Carregado and helping its Carregado facility to achieve a 30% reduction in carbon emissions. PepsiCo Portugal's biodigester will use the sludge produced at the plant's wastewater treatment plant and potato peelings, as well as other food waste deemed unfit for consumption. This waste is pre-treated and converted into clean organic compost and transformed into biogas. The project is part of the PepsiCo Positive (pep+) strategy for sustainability. The new biodigester will have the capacity to convert more than 21,900 tons of organic waste per year into 4,818,000 Nm³ of biomethane per year, which is equivalent to a 30% reduction in carbon emissions during the production process.

January 25, 2023, **Read More:** ([Click here....](#))

5. "Nine million kilograms" of food waste sent to the AD factory under the NZ program run by Auckland Council

Auckland Council in New Zealand has accomplished an accommodable job by preventing nine-million-kilogram food scrap from dumping into landfills. Locally owned company Ecogas, New Zealand's only anaerobic digestion facility converts the food scrap into renewable energy and liquid fertilizer. Food scrap collection is done by rukenga kai (food scraps) collection service. More than 4,40,000 food scrap bins were delivered by the organization over the past seven months in urban Auckland. Auckland Council use four tier approach for collection of food scrap. The approach involves preventing food waste in the first place, supporting redistribution of food through food rescue initiatives, encouraging home and community composting, and collecting the remainder with the kerbside collections of food scraps. Auckland Council revealed that the food scrap collection started in April in Waitakere whereas collection started in November in urban areas of Rodney and Franklin. Over the period, about 9000 tonnes of food scrap has been collected. Richard Hills, Chair of the Planning, Environment and Parks Committee said that Aucklanders are defining waste to valuable resource by utilizing food scrap which was once considered as waste. He said "Our aspiration for Auckland to become a zero-waste city by 2040 is much closer with most residents now able to access the food scrap collection service. Food scraps that once created only harmful greenhouse gases in landfill are now contributing to a circular economy solution.



June 09, 2023, **Read more :** ([Click here....](#))

6. Biomethane-Focus of the Brazilian government for the production and sustainable use

Brazilian government is taking measures to encourage the production and sustainable use of biomethane, a biofuel obtained by the purification of biogas, which can replace natural gas, diesel and gasoline. In order to help reduce greenhouse gas emissions and provide energy security in Brazil, a decree and two executive orders were signed that encourage the use of biomethane as a renewable and environmentally sustainable energy source. Investing in biomethane under the Special Regime of Incentives for Infrastructure Development (Reidi) is one of the signed measures. This will help build new biomethane production facilities and install green corridors to serve heavy vehicles. Additionally, the government launched Methane Zero, the National Program for the Reduction of Methane Emissions. By promoting sector-specific agreements and lowering methane emissions, the program will help Brazil fulfill its obligations stated during COP26.

May 09, 2022, **Read More:** ([Click here....](#))



7. UK ports to have access to 100% renewable biomethane with new HGV refuelling station

Leading supplier of renewable biomethane (Bio-CNG) in Europe, ReFuels N.V has commenced a construction at its station in Doncaster for the decarbonisation of heavy goods vehicles (HGVs). One of the UK's largest logistic hubs in South Yorkshire which has about 90% of the country's population and four largest ports in the country will be accessible to the station in 4-5 hours. ReFuels claimed that new station will bring the reduction in emissions by over 90% compared to diesel as 76% intermodal journey involving HGVs beginning or ending at a shipping dock. Immingham Dock which is UK's largest port by tonnage is within an hour distance from the new station enabling the fleet to run on 100% renewable biomethane for the first time. The UK's largest port by tonnage, Immingham Docks, sits within an hour's range of the new station, enabling fleets travelling



to and from the port to run on 100% renewable biomethane for the first time. Twelve refueling pumps at the new station will be able to refuel more than 500 HGVs every day. If fully utilized, this may reduce 60,000 tons of CO₂ annually. According to Philip Fjeld, CEO and co-founder of ReFuels, "Fleets around the country are under significant pressure to slash emissions and today, there's only one viable option – 100% renewable

biomethane. In order to meet the growing demand for low-carbon fuel, ReFuels is still expanding its network of stations nationwide through opening new locations. The station is a collaborative venture between investment management firm Foresight Group, which focuses on sustainability, and CNG Fuels, and ReFuels.

November 28, 2023, **Read more:** ([Click here....](#))

12. SEBIGAS lands in Puglia with a new biogas plant for Wakonda, the first one in Europe fed with cactus (21 June 2023)

Sebigas, a company specialized in the design and construction of biogas and biomethane plants, signs a contract with Wakonda SpA, an innovative agricultural startup from Lecce, Italy. A biogas plant fed with Opuntia (prickly pear) blades and other agriculture by-products will be constructed for production of electricity, thermal energy, and high-quality organic fertilizer. Wakonda project will use the



lands unsuitable for noble crops that, like so many others in Puglia and in the south of Italy in general, run the risk of remaining uncultivated and abandoned. the biogas plant will be fed with 16000 tons per year material including cladodes – the blades of the prickly pear tree, olive pomace, wine pomace, whey, and poultry manure. Sebigas role is as a technology provider to the client and will accomplish the design, construction of the plant.



The power capacity of the plant will range up to 300 kW and the electricity will be sold to the grid, the heat will be fully utilized in Wakonda's production cycles; the digestate, rich of nutrients, will be used as a fertilizer for the surrounding land. Once in operation, the new plant will avoid the release of more than 11,000 tons of CO₂ into the atmosphere each year.

June 21, 2023, **Read more:** ([Click here...](#))

8. Wärtsilä Extends Existing Biogas Plant to Produce 45 Tons of BioLNG Per Day

Technology group Wärtsilä will supply, install, commission and start-up the biogas upgrading and liquefaction units for a Swedish bioLNG plant. The new plant is an extension of an existing biomethane and bioLNG plant supplied earlier by Wärtsilä, and will bring the production of bioLNG from 20 to 45 tons per day. The plant, located in Linköping, is owned by Tekniska Verken, a municipality owned company and a pioneer in Sweden in biogas and bioLNG production. The Wärtsilä processing solution includes its patented VAC vacuum technology option in the upgrader, which offers greater flexibility for the heat supply to the upgrader. This allows the customer to supply the needed process heat from their own district heating network. The plant produces biomethane from organic waste,



including food waste, and from the municipality's wastewater treatment residue. The bioLNG is used as fuel for the transport sector and industry in Sweden. At Tekniska Verken's subsidiaries Svensk Biogas bioLNG filling stations for heavy vehicles represents a circular business model. It is fully renewable and, depending upon the feedstock from which it is produced, can even be carbon negative. The Wärtsilä scope features its Puregas biogas upgrading system Puregas CA, its Mixed Refrigerant (MR) biogas liquefaction solution, a 250 m³ storage tank, an export station, and a Boil Off Gas (BOG) module. The biogas upgrading system has the capacity to also send biomethane to the local biogas grid. The Wärtsilä equipment is scheduled to be delivered in December 2024, and the new plant is expected to become operational in the first half of 2025.

(December 12, 2023), **Read More:** ([Click here....](#))

9. Bio Capital announces “historic” first renewable gas injection for Northern Ireland

Granville Eco Park, Dungannon, a Bio Capital Group company, has started injecting renewable biomethane into the local gas network, in what the company said was "a first for Northern Ireland". Having installed a £1.2 million (€1.3 million) gas-to-grid system at its existing anaerobic digester, Bio Capital added it has the capability to export enough gas to decarbonise Dungannon's entire annual gas consumption. Because biomethane is similar to natural gas, it is able to be blended into the network without the need for any changes in transmission and distribution infrastructure or end-user equipment. This is the first major step in increasing the amount of power, heat and transport that can be fuelled by renewable gas. Diverting biodegradable waste from landfill to generate biomethane is also in line with the draft Circular Economy Strategy and the Department of Agriculture, Environment and Rural Affairs (DAERA) ambition to ban biodegradable goods going to landfill by 2030. The direct injection of biomethane into the Evolve grid represents a tangible transition from theoretical discussions to a concrete demonstration of the pivotal role gas networks in Northern Ireland are set to play.

(November 20, 2023), **Read More:** ([Click here....](#))

10. BIOGEST France inaugurates biomethane plant in Congrier

BIOGEST France inaugurates a biomethane plant in Congrier that processes over 32,000 tons of waste annually. With an output of 135 Nm³ /h, the PowerRing plant provides biomethane for the local distribution gas network. The feedstock consisting of over 32,000 tons of cattle and horse manure and slurry per year is supplied by 9 farms with an average distance of 5 km to the plant. The short supply routes help to keep the impact on the environment low and make the biomethane plant particularly easy to operate. In addition, the farmers are producing organic fertilizer simultaneously, which is returned to the farm's fields. BIOGEST® is a pioneer brand offering full-service biomethane and biogas plant solutions worldwide and is headquartered in Vienna, Austria. With more than 30 years in the business, BIOGEST has realized 180+ projects in over 20 countries. The tried and tested BIOGEST technology is created to customize green gas projects from strategic planning to co-investment, construction, operation, maintenance, and management of plants.

September 19, 2023, **Read More:** ([Click here....](#))



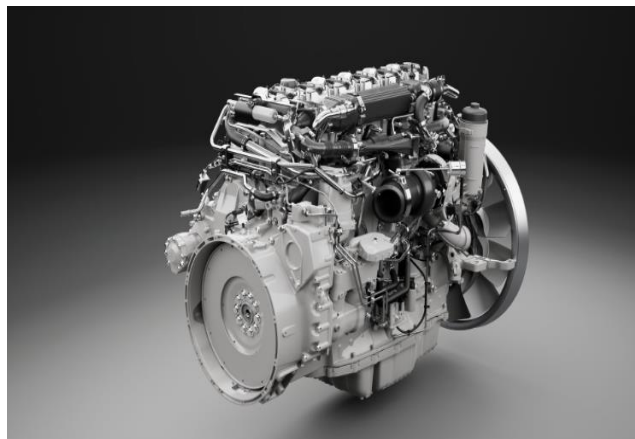
11. EnviTec biogas building 15 biogas and gas upgrading plants in the USA

EnviTec Biogas is currently completing anaerobic digestion and biogas upgrading projects at New York, Connecticut, Minnesota, Indiana and South Dakota. The plants, all of which use manure from dairy cattle as input, will inject RNG (renewable natural gas) into the existing natural gas infrastructure after commissioning. If there's no local connection to the natural gas grid, the gas will be trucked to the injection stations. German based company is one of the few all-round providers in the US market, offering planning, construction and commissioning of biogas and biogas upgrading plants and after sales support including technical and biological services.

May 15, 2023, Read more: ([Click here....](#))

12. Scania's new biogas engines have just got greener

Scania has launched its latest generation of biogas engines, which offer a 5% fuel savings over its predecessors. First teased at last year's IAA show in Hanover, Germany, the new 13-litre biogas engines are available with either 420 hp or 460 hp, and utilise components from the latest generation Super diesel powertrain, to help it improve its fuel saving potential. When the new engines are



paired with the G25 gearboxes and axles, testing has proven that operators could see up to a 5% fuel saving on long-haul operations. The engines are a refinement of the previous generation 13-litre gas units, with the power outputs increased and preparation to meet future legal demands. Ola Henriksson, Senior Product Manager for Renewable Fuels at Scania Trucks, said: "Biomethane fuels are the solution for those customers who want to start a decarbonisation journey without any delay. Scania sees biogas vehicles playing a

crucial role in helping the industry decarbonise and switch away from diesel, with the ability to reduce CO₂-emissions by up to 90% from a well-to-wheel perspective. The gas infrastructure across Europe and in the UK is also rapidly expanding and becoming more mature, thanks to increasing demand.

(December 7, 2023), **Read More:** ([Click here....](#))

13. Finland's largest biogas plant projects are progressing

Two anaerobic digestion (AD) plants developed by Wega Group Oy (Wega) and Copenhagen Infrastructure Partners (CIP), are progressing. Each plant is expected to produce ~150 GWh of liquefied biomethane per annum. The plant will use manure and other agricultural waste streams as raw materials. The planned processing capacity is expected to be +400,000 tons p.a., with a production expected to reach ~150 GWh per annum. In addition, biogenic CO₂ will be produced at site, which potentially could be used for the production of e-methane. The development of an AD plant has also been started in Pöytyä in the Southwestern Finland. The plant is intended to receive +300,000 tons of manure and other waste streams from the agriculture- and food industry. By treating manure in a biogas plant, the company intend to contribute to the reduction of the nutrient exposure in the Baltic Sea, improve the nutrient efficiency of Southwestern Finland and produce green molecules which can be used in the transportation sector.

(December 5, 2023), **Read more:** ([Click here....](#))



Upcoming Events

National

- 1. National Training Programme on Biogas Production, Power Generation and Compressed Biogas Technology**
17–19, January 2024
Biogas Development and Training Centre, Center for Rural Development and Technology, Indian Institute of Technology Delhi
For more information visit: [National Training Program on Biogas Production, power generation and Compressed Biogas CBG Technology: IIT Delhi](#)
- 2. National Hands-on Training Programme on Biogas Technology and its Implementation (Biogas Generation, Enrichment, Design, Testing, Operation & Maintenance, and Policy & Financing)**
Feb 19-23, 2024
Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala, Punjab and
For more information visit: [Hands on Analytical and Molecular Techniques: One Week National Training Program \(s3waas.gov.in\)](#)

International

- 1. World Biogas Expo 2024**
10-11 July – NEC Birmingham, UK
For more information visit: The World Biogas Expo 2023 | 2023 Event Guide (biogastradeshow.com)
- 2. International Conference on Progress in Biogas VI**
September 2 - 4, 2024
Stuttgart, Germany
For more information visit: [International Conference Progress in Biogas VI - Biogas Community](#)
- 3. Progress in Manure and Digestate: International Online Conference**
23. - 25. January 2024
For more information visit: Online Conference - Progress Manure & Digestate Treatment | IBBK Biogas (ibbk-biogas.com)
- 4. BIOGAS AMERICAS 2024 – Savannah, GA**
May 13, 2024 - May 16, 2024
Savannah Convention Center, International Drive, Savannah, GA, United States
For more information visit: [BIOGAS AMERICAS 2024 - Savannah, GA - American Biogas Council](#)