



**BIOGAS FORUM INDIA**

**(BigFIN)**

**E-Newsletter, Volume 11, No. 2  
(July-December, 2019)**



**Corresponding Address: Biogas Forum India, Centre for Rural Development and Technology**

**Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016 INDIA**

**Phone: 011-26596351 (O), Fax: 011-26596351, 26591121 Email: [bigfin.india@gmail.com](mailto:bigfin.india@gmail.com)**

<b>Sr. No.</b>	<b>Contents</b>	
1.	From the Editor's desk	1
2.	President's Column	2-3
3.	Some Initiatives in the last six month by CRDT, IIT Delhi	4-8
4.	Biogas Related articles	9
5.	News Highlights- National	10-14
6.	News Highlights- International	15-19
7.	Upcoming Events	20

## From The Editor's Desk...



Biogas Forum India's (BigFIN) journey entered into 11<sup>th</sup> year with a lot of new beginnings and exchange of ideas with the promotion of biogas and its entrepreneurship in the country. The motto of publication of this newsletter is to keep the BigFIN members updated with the latest news about different segments of biogas R&D, and new initiatives. Biogas Forum aims to spread awareness of the values of sustainability as well as the innovative ways in which India continue to meet the challenges and conquer the inadequate energy supply situation. In this perspective, it is important to learn from the other parts of the world as well for our latest edition (Volume 11, Number-2) which discuss the same with various stakeholders throughout the world.

Under the various programme of Biogas, the waste to energy programme achieved 330 MWeq out of the total potential of 5690 MWeq. This programme promotes setting up of Biogas/ Compressed biogas/ power plant based on urban, industrial waste and agricultural residues. The nation's biggest programme on biogas i.e. "New National Biogas and Organic Manure Programme" can also meet the requirement of basic energy demand with collaboration with other programs like Galvanising Organic Bio-Agro Resources Dhan (Gobar-DHAN). Gobar-DHAN is an initiative to use the bio-waste to produce biogas and apparently to clean the villages, which could achieve the objectives of Swachh Bharat Mission.

The Government has started a programme "UJJAWALA Scheme" to provide free LPG connections. However, LPG is a non-renewable source of energy. It can be replaced through biogas which required intensive support from government and R&D lab facility

We hope that you find this issue both interesting and inspiring; your inputs to grow this sector will always be welcome.

Thank you.

**Virendra Kumar Vijay**

**General Secretary, Biogas Forum-India (BigFIN)**

## President's Column



India is one of the pioneers in the global biogas movement. In fact, the global biogas journey began in India in the late eighteenth century in Matunga, Mumbai, wherein biogas was used for lighting purpose. Thereafter, the concept of biogas gained a lot of attention worldwide, because of its promise to meet dual demand – as a fuel and also as a fertilizer, along with the scientific treatment of waste.

India's production of biogas is quite small. It only produces about 2.07 billion m<sup>3</sup>/year of biogas, while it is estimated that the potential could be as much as 71 billion m<sup>3</sup>/year. However, the movement, so far, has not really lived up to its true potential. Meanwhile, the Government of India has made many bold announcements in the energy domain, like universal electrification (with 24×7 electricity by 2022), and targeting a reduction in oil import by 10% from 2014-15 levels, by 2022.

The present cumulative installed capacity of biogas plants lags significantly behind at less than one GWeq. Thus, from the policy standpoint, there is a need to focus attention on research, design, development and demonstration for propelling the biogas industry to become competitive and self-sustainable.

In the yesteryears, the traditional feedstock for biogas production was, predominantly, cattle manure. However, the early twentieth century saw India bringing innovation into biogas production by exploring new and unique feed options like biogas from rotten potatoes, vegetable waste, fruit waste, rotten grains, kitchen waste, agricultural waste and industrial waste (like press mud), food processing waste, spent liquors, etc.

There are significant differences between biogas and fossil fuels, but for India, one of the biggest difference is that biogas can be produced at home. It is very expensive to find, dig-up and transform crude oil into gas, but biogas doesn't have the same barriers.

Biogas would be the most beneficial to people in India because it would help ease the strain of delivering reliable energy based on fossil fuels, and would allow the country to become more energy independent. Furthermore, the rural areas are places where the raw material for biogas is abundantly available, such as animal manure, crop residues and poultry litter.

Amongst the various programmes on biogas, SATAT is one of the most focused. It was launched in October, 2018, by the Ministry of Petroleum and Natural Gas, Government of India, aiming to install 5000 compressed biogas plants by 2025. Those plants will produce around 15 million tonnes of compressed biogas yearly, which is about 40% of the current demand for compressed natural gas in India.

Your feedback on this latest issue of Vol. 11, No. 2 would be invaluable to us; so please do write to us on [bigfin.india@gmail.com](mailto:bigfin.india@gmail.com), with your views and suggestions.

**Dr Neeraj Sinha**

**Senior Advisor**

**NITI Ayog**

**President, Biogas Forum-India (BigFIN)**

## SOME INITIATIVES/ACTIVITIES HELD IN CRDT, IIT DELHI DURING LAST

### SIX MONTHS

#### **1. A joint faculty meet of CRDT-IIT Delhi, CTARA-IIT Bombay, and CST IISc Bangalore**

CTARA IIT Bombay - CST IISc Bangalore- CRDT IIT Delhi joint faculty meeting at IITB under Institute of Eminence was held to plan various issues jointly for Joint M Tech program on Technology and Development, inputs for Rural Technology developments as a main stream in IIT and NIT systems, inclusion of societal technology development activities in NIRF and QS ranking system, Development of Practice model and joint PhD supervision etc. These three centres are renowned in the world for their society relevant work.



(16<sup>th</sup> July 2019, LinkedIn-Prof VK Vijay)

#### **2. Tech4Seva-A three days National workshop in IIT Delhi**

Tech4Seva a national workshop connecting technology to community was inaugurated at IIT Delhi organised by Unnat Bharat Abhiyan and Vijnana Bharti in which more than 650 participants were participate including Scientists, technology developers, grassroots workers, NGOs. The workshop was inaugurated by Dr. Ashutosh Sharma, Secretary DST and Shri R. Subrahmanyam, Secretary, MHRD. UBA and Vijnana Bharti had come together to host this workshop on the following 6 themes: Agriculture, Livelihood, Sustainable Energy, Swasth Bharat, Environment and School Education. Prof. Ramgopal Rao, director IIT Delhi in his welcome address emphasized on connecting higher educational institutions with the society and rural areas. Prof. Ashutosh Sharma, Secretary, DST, in his address emphasized on

connecting technology with society through Tech4Seva. The workshop had very interesting exhibition too, ranging from edible plates to organic soap.



(10-12<sup>th</sup> August 2019, LinkdIn-Prof VK Vijay)

### 3. Prof. VK Vijay's Lecture at Biogas Upgrading and CBG Roundtable 2019, Chiang Mai University, Thailand

The Biogas Upgrading and CBG Roundtable 2019 was held in Chiang Mai University, Thailand in 14-15<sup>th</sup> August 2019. The aim of the conference was reviewing the current status of biogas usage in South East Asia as well as the challenges and opportunities in the way forward. Prof VK Vijay and Dr Rimika Kapoor from CRDT, IIT Delhi were invited as the speaker for the conference. Prof. Vijay deliver a lecture on water scrubbing based biogas enrichment technology: A significant contribution to Decentralized CBG production and Utilization.



(14-15<sup>th</sup> August 2019, LinkedIn-Prof VK Vijay)



#### 4. International Technical and Economic Cooperation (ITEC) Training Program

The ITEC programme was held in IITD Sonipat Campus during 14-15<sup>th</sup> October 2019. The programme was conducted by CRDT, IIT Delhi with the support of Ministry of External Affairs, Govt. of India. Participants from 18 countries were the part of this successful training programme. The aim of this program was to deliver the key ideas about biogas production, power generation and its enrichment for vehicular application.



## 5. An invited talk by Prof. VK Vijay on India International Science Festivals (IISF) 2019

Prof Vijay from CRDT IIT Delhi Delivered an invited talk on “Cow based Economy for Holistic Rural Development” in India International Science Festival 2019 in Kolkata and participated in the Prime Ministers Address to the gathering.



(6<sup>th</sup> November 2019, LinkedIn-Prof VK Vijay)

## **BIOGAS RELATED ARTICLES**

### **1. Integration of flash vessel in water scrubbing biogas upgrading system for maximum methane recovery**

High CH<sub>4</sub> purity in upgraded biogas concomitantly results in high CH<sub>4</sub> loss during water scrubbing biogas upgrading process. In the current study, central composite design based on response surface methodology was used to recover maximum CH<sub>4</sub> by optimizing a flash vessel integrated in a water scrubbing biogas upgrading system. Optimum CH<sub>4</sub> recovery of 8.46% was achieved from flash vessel at 2 bar flash pressure and 90 second retention time with simultaneous bioCH<sub>4</sub> recovery of 90.73% from the scrubbing column with 0.77% CH<sub>4</sub> loss from the system. CCD predicted values were confirmed experimentally under the modelled optimum conditions and showed strong agreement with an R<sup>2</sup> value > 0.98. Flash gas blended with biogas was recirculated into the water scrubbing column for upgrading. At 10 Nm<sup>3</sup>/h gas flow rate, pressure of 12 bar and 2.1 m<sup>3</sup>/h water flow rate, 91.3% CH<sub>4</sub> in upgraded gas was obtained with energy consumption of 0.29 kWh/Nm<sup>3</sup>.

(Kapoor et al., 2019. Bioresource Technology Report; 100251)

### **2. Pre-treatment and co-digestion of waste water sludge for biogas production: Recent research advances and trends**

Currently, sludge is not considered as a waste any more, since it is capable of producing valuable products. Besides land disposal and thermochemical processes, biological processes appear as promising valorisation routes to treat wastewater sludge efficiently. Anaerobic digestion (AD) processes are already being applied at industrial scales for the effective disposal and valorisation of sludge. However, methane yields from sludge anaerobic digestion remain low compared to other types of organic waste. Thus, pre-treatment and co-digestion contribute to improve the degradability of organic matter and methane potential of sludge, respectively. This paper reviews the recent achievements in sludge pre-treatment and co-digestion with other substrates such as the organic fraction of municipal solid waste, fatty waste, lignocellulosic and algal biomass. Furthermore, recent studies combining co-digestion and pre-treatment are examined. The paper also provides recommendations to better manage sludge recovery by taking into account multiple aspects such as techno-economic feasibility, the effect of pre-treatment on both the physico-chemical properties of sludge and the quality of digestate. The socio-environmental and legislative aspects are also essential in order to ensure the sustainability of the process. [\[Read More...\]](#)

(Elalami et al., 2019. Renewable and Sustainable Energy Review; 114: 109287)

## **NEWS HIGHLIGHTS – NATIONAL**

### **1. Government to set up 76,000 small biogas plants this fiscal**

The government plans to set up 76,000 small biogas plants in 2018-19 under the New National Biogas and Organic Manure Programme (NNBOMP). Under the programme, the maximum size of family type biogas plants has been enhanced from 6 to 25 cubic metre capacity to cover untapped potential of biogas energy in remote/rural and semi-urban areas.

The central financial assistance under the programme has been enhanced and it varies from Rs 7,500 to Rs 35,000.

(4<sup>th</sup> July 2019, The Times of India)

### **2. Rudrapur Municipal Corporation- the first municipal corporation to set up compressed biogas plant**

Rudrapur generates approximately 100 metric tonnes of waste per day but due to unscientific method of its disposal and lack of sanitation staff, the garbage is left to rot in open on the existing trenching grounds at Dudhiyanagar, Kichha Road. Both of these dumping grounds have already reached their full capacity.

In a bid to ensure better waste management in the district, the Rudrapur Municipal Corporation (RMC) authorities are planning to set up a compressed biogas (CBG) plant to convert biodegradable waste into cooking gas.

This would be the first compressed biogas plant of the district. The proposed plant is expected to produce 60 cylinders (14 kg capacity) of biogas per day.

Reportedly, the project will be completed in seven to eight months after the project gets all necessary approvals and the proposed plant is set to span across 10 acres of land approximately.

(16<sup>th</sup> September 2019, The Times of India)

### **3. Indian biogas plant to install zero-carbon solution**

Indian firm Energy Power has partnered with US-based Bloom Energy to install a zero-carbon solution at its biogas plant in Maharashtra. Energy Power will deploy an integrated zero-carbon solution to combine its new agricultural and municipal waste digester with solid oxide fuel cells to produce renewable power for its customers.

The project is expected to supply clean, reliable power to local businesses in Shirala district, according to a report by Power Technology. By the first half of 2020, Bloom Energy plans to install and operate its 4 MW energy servers at the plant. The digesters have been designed to break down and clean bio-waste to produce bio-methane and will fuel the company servers. The servers have been developed to make use of

natural gas, biogas or hydrogen as fuel, and produce power without combustion through an electrochemical process.

(9<sup>th</sup> October 2019, Bioenergy Insight)

#### **4. India's first plant to convert paddy straw into biogas near Delhi to tackle pollution**

India's first plant to convert paddy straw into biogas that can be used as CNG in automobiles will come up at Karnal in Haryana as agencies double effort to prevent burning of crop stubble that is said to be the main reason for pollution in the national capital region. ES Ranganathan, managing director of Indraprastha Gas Ltd, the largest CNG distribution company in India, led the ground breaking ceremony of the plant to convert paddy straw into compressed biogas (CBG) at Karnal, Haryana.



The plant will deploy special machines that will chop and bundle paddy straw for transportation to a storage. This storage will be used throughout the year to produce CBG. This unit will have the capacity to convert stubble generated from 20,000 acres of farmland in a year into gas, which will then be sourced by IGL for its City Gas Distribution (CGD) network in Karnal.

This unit, which will come up by 2022, has been set up by Ajay Bio-Energy Pvt Ltd, under 'SATAT' (Sustainable Alternative Towards Affordable Transportation) scheme on CBG. The plant will produce maximum of 10,000 kg CBG every day. The input of plant is majorly paddy straw. The plant has the capacity of consuming around 40,000 tonnes of paddy straw in a year. [\[Read More...\]](#)

(20<sup>th</sup> October 2019, The Economic Times)

## 5. Haryana gets 38 proposal to generate biogas from stubble

Haryana Power and New and Renewable Energy Minister, Ranjit Singh said that agreement has been signed with Indian Oil Corporation Limited for setting up a Compressed Biogas (CBG) plant in the state for disposal of Stubble. About 24 lakh metric tons of stubble will be consumed in 200 projects for the production of 1000 TDP CGB. He said that 24 firms have given a proposal for 38 project to set up a CBG plant of 234 tonnes per day capacity in Haryana.

Apart from this, stubble will also be used in thermal plants. About 50 to 55 lakh tonne of stubble is produced in the State every year. For its disposal, several ambitious projects are being started in the State, in which about 40 lakh tonne of stubble will be consumed, the Minister added. [\[Read More...\]](#)

(19<sup>th</sup> November 2019, The Economic Times)

## 6. The East Delhi Municipal Corporation (EDMC) starts operation of biogas plant in Geeta Colony

EDMC has recently started its new biogas plant in Geeta Colony. The further plan is to set up one more biogas plant in East Delhi area.

The objective behind installing the biogas plants is to solve twin issues of waste management and electricity.



Civic Corporation aimed to use bio waste such as peels of vegetables and fruits, waste food and cow dung to convert it into biogas with the help of plants.

Chairperson of Standing Committee, Sandeep Kapoor said, “It will give a boost to civic corporation’s plan to make East Delhi as a waste-free zone. The project will be executed on build, operate and transfer (BOT)

basis for 10 years. In other words, it means that the private firm will be responsible for its construction and maintenance for 10 years.”

As far as the capacity is concerned, each plant can treat up to 500 metric tonnes of waste. Around one tonne of waste has the capacity to generate 60 metric cubes of gas which can be used to produce electricity to light 200 streetlights for 8 hours.

Around 3,500 dairies will send their waste (up to 400 metric tonnes) to the biogas plant. In return, the dairy owners will gain monetarily. After Geeta Colony, Shastri Park and Seemapuri are also in list to execute the plan. [\[Read More...\]](#)

(28<sup>th</sup> November 2019, City Spidey)

### **7. Waste to Biogas System implemented at Microsoft Bengaluru**

Microsoft Bengaluru added another feather by implementing a state-of-the-art biogas plant for 100 percent in-situ processing of organic waste at the Prestige Ferns Galaxy campus. The campus houses 4,000 employees and produces 700 kg of organic waste per day. The grand inauguration took place on Wednesday, 11 December 2019 in the presence of Riku Pentikainen (Director - Asia RE&F), Ambar Mitra (India Lead – RE&F) along with Bengaluru site leaders Anish Chandy (Director - GSMO), Vijay Rajagopalan (Partner Director - IDC) and with newest employee Rekha Anil (India Lead - CSS). The leaders were felicitated for taking the time off their busy schedule and showing the support for sustainability in our day to day operations.



The system installed is the BioUrja by GPS Renewables, Bengaluru - a fourth generation multi-patented and IOT enabled biogas plant, which was recently named one of the Mission Innovation Top 100 global technologies for maximum potential of GHG mitigation.

The plant is capable of processing a ton of organic waste per day, has a negligible water footprint unlike older generation biogas plants, and can substitute up to 20,000 kg of LPG per annum in the kitchens of the site. In a country like India where 80% of all waste goes to landfills where it forms leachate, emits methane and odour, Microsoft will be mitigating ~2,200 tons of CO<sub>2</sub> equivalent per annum with this initiative. [\[Read More...\]](#)

(13<sup>th</sup> December 2019, LinkedIn)

#### **8. OMCs issue 500 letter of intents (LoIs) for compressed biogas units, EoI extended till March**

The oil marketing companies under the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme have issued over 500 letter of intents (LoIs), as of date, to private developers to set up compressed biogas (CBG) plants across the country. The OMCs have also extended the last date for expression of interest (EoI) to March 2020 as it failed to generate satisfactory response from developers initially.

Vijay Sharma, director, ministry of petroleum and natural gas (MoP&NG), said, at a road show on CBG in Mumbai, that, “CBG would help in effective waste management, reduction in carbon emissions, and creating additional source of revenue for farmers. The aim of the scheme is to replace the compressed natural gas (CNG) which is produced from fossil fuel in the long run.”

“If total potential of CBG is exploited in the country, India can produce around 62 million metric tonne equivalent of CBG annually, which is sufficient to replace the entire gas demand of the nation and make the farmers from ‘Annadata’ to ‘Urjadata’ and contribute in making a brown revolution for energy.”

The minimum plant size has been fixed at 2 tonne per day and is expected to cost between Rs 2 crore to Rs 6 crore. Majority of the LoIs have been issued in Uttar Pradesh, Chandigarh, Maharashtra, Haryana and Punjab. [\[Read more...\]](#)

(24<sup>th</sup> December 2019, Financial Express)



## **NEWS HIGHLIGHTS – INTERNATIONAL**

### **1. Host launches first biogas project in Japan**

Dutch bioenergy installation firm Host has launched its first biogas project in Japan. Working in partnership with Techno System, a Japanese energy firm, Host has signed a contract for a 550kWe biogas power plant project in Ishigaki Island, off the south-west coast of Japan. The plant will provide electricity from manure, grass and other organic waste to power around 1,300 homes.



Fig. Contract signing ceremony with Host in Tokyo, Japan

The signing ceremony took place at the Embassy of the Kingdom of the Netherlands in Tokyo, Japan, and was attended by His Excellency, the Ambassador of the Kingdom of the Netherlands for Japan, Mr. Peter van der Vliet, as well as high-level Embassy delegation of the Department of Agriculture.

(25<sup>th</sup> September 2019, Bioenergy Insight)

### **2. Plans for Dubai's first biogas plant take shape**

Plans for the first biogas plant to be built in Dubai are taking shape. Dubai Municipality will build the plant at the city's Warsan Sewage Treatment Plant in partnership with global waste management firm Veolia, at a cost of around Rs. 4856.1 million. Once fully operational, it is hoped the biogas project will help to save Rs. 6312.29 million through reduced electricity consumption and carbon emissions.

According to a report by the Khaleej Times, Dawoud Al Hajiri, director-general of Dubai Municipality, said the project could help to reduce CO<sub>2</sub> emissions at Warsan by 31,000 tonnes per year. He said: "This

project is guided by the Dubai Clean Energy Strategy 2050, which seeks to make Dubai the world's least carbon footprint city by 2050.”

“The project includes the construction of a plant with an annual production capacity of 45,000 MW power, which is equivalent to 50% of electrical power needs for the Warsan plant. The plant will convert 58,000 cubic metres of biogas per day into electricity. [\[Read More...\]](#)

(30<sup>th</sup> September 2019, Bioenergy Insight)

### **3. Scientists in Australia develop graphene filter to extract methane from biogas**

Scientists at the University of New South Wales (UNSW), Australia have designed a graphene filter to purify methane from biogas. The research team, led by Dr Rakesh Joshi of the UNSW School of Materials Science and Engineering, found that graphene membranes can be used to extract methane present in biogas generated during the breakdown of organic materials in wastewater plants. The discovery has been praised as “positive news for the wastewater and the renewable energy industries” by Dr Joshi.

The research shows that it is possible to purify methane from biogas in a wastewater treatment facility environment, creating a potential further source of renewable energy. Biogas is a mixture of methane and other impurities and is produced during anaerobic digestion. [\[Read More...\]](#)

(18<sup>th</sup> October 2019, Graphene-Info THE GRAPHENE EXPERT)

### **4. Bio-methane one of the “best-positioned fuels” to help reach net zero emissions**

Bio-methane has been named as one of the best-positioned fuels to reach net zero emissions by a recent study. The joint study by Lloyd's Register (LR) and A.P. Moller – Maersk (known as Maersk) found that the best opportunities for decarbonising shipping lie in finding new sustainable energy sources. Based on market projections, the study found that bio-methane, alcohol and ammonia are the best options. [\[Read More...\]](#)

(25<sup>th</sup> October 2019, Bioenergy Insight)

### **5. Dairy farm, BMW partner on biogas electricity to power cars**

Straus Family Creamery, a leader in organic farming and sustainable dairy innovation, announces a collaboration between its Founder and CEO Albert Straus' organic dairy farm and BMW Group. Together, they're making low carbon charging available for BMW's electric vehicle (EV) customers in California allowing EV drivers to “source” a cleaner charge from electricity generated at an organic dairy farm.



This collaboration between the Straus Organic Dairy Farm and BMW Group is using a new pathway that uses biogas to create electricity that can charge electric cars. It's the first-of-its-kind in the auto industry. Through the Low Carbon Fuel Standards Program, they're creating renewable energy with negative carbon intensity—one of the cleanest energy sources available in California. [\[Read More...\]](#)

(27<sup>th</sup> November 2019, Biomass Magazine)

## **6. Mitigation of 2.6 MT CO<sub>2</sub> through using bio-methane in Ireland**

By replacing 12% of current natural gas consumption with bio-methane, Ireland can save 2.6m tones of CO<sub>2</sub> per annum and create over 3,000 jobs by 2030. This was one of the key messages from members of the Renewable Gas Forum of Ireland (RGFI), who presented their case for bio-methane to be included in Ireland's energy mix to the Joint Committee on Climate Action.

Donal Dennehy, director of Danone Ireland (RGFI member) acknowledged the Government's review into the potential of anaerobic digestion to supply bio-methane (upgraded biogas) in their draft National Climate Action Plan (NCAP). However, he raised concerns that the figures used in the Marginal Abatement Cost Curve (MACC) analysis in the plan were incorrect which suggest that bio-methane was not cost effective. [\[Read More...\]](#)

(4<sup>th</sup> December 2019, GNV Magazine)

## **7. RNG industry launches SMART Initiative**

The Renewable natural gas is biomethane which is also known as sustainable natural gas. The Coalition for Renewable Natural Gas (RNG Coalition) announced the Sustainable Methane Abatement and Recycling Timeline (SMART) Initiative at the RNG 2019 conference in Dana Point, California, casting

the vision for RNG stakeholders to develop an action plan to sustainably capture and repurpose methane that would otherwise be wasted via flare or escape fugitively into the atmosphere from more than 43,000 sites in North America by 2050.



There are more than 4,400 landfills, 19,000 large farms and 20,000 wastewater treatment and lagoon facilities, food waste and agricultural sites in the US and Canada, where methane emissions naturally occur as organic materials decompose.

The SMART Initiative follows on the heels of the renewable natural gas industry surpassing its prior 2025 objective earlier this year, five years ahead of schedule. At the RNG 2015 Conference the RNG Coalition’s co-founders challenged the industry to more than double the number of operating RNG production facilities in operation to more than 100 by 2025. The RNG industry rallied and achieved this goal. There are now 110 operational RNG production facilities in North America, marking a substantial increase in sustainable development from the 41 facilities constructed between 1982 and 2014.

(5<sup>th</sup> December 2019, Biomass Magazine)

## **8. World first combine harvester to run on Compressed natural gas**

A Belarusian machinery manufacturer showed off the world’s first combine to run on compressed natural gas (CNG) at the recent Agritechnica 2019.

Gomselmash showed off the innovative machine “Palesse GS 4218 CNG” at the Hanover event. The ‘world’s first environmentally friendly combine’ is powered by compressed natural gas – methane.

According to the firm, it is the only agricultural machine in the world that provides emissions toxicity at the level of the environmental class Stage V without using Adblue or urea and particulate filter.

Instead of a regular fuel tank the harvester is fitted with eight gas cylinders with the capacity of 1,816 litres, or up to 400 m<sup>3</sup> of compressed methane gas. [\[Read More...\]](#)

(6<sup>th</sup> December 2019, GNV Magazine)

### **9. Biogas use picking up in Trashiyangtse, Bhutan**

About 62 households in Trashiyangtse are now opting to use biogas as the primary source of energy for cooking purposes. Of the eight gewogs, Ramjar gewog has 61 plants are under construction followed by 18 plants in Bumdeling gewog. [\[Read More...\]](#)



(10<sup>th</sup> December 2019, KUENSEL)

### **10. Mazoon Dairy inaugurates first biogas plant in the region**

Mazoon Dairy Company has commenced operations of the first-of-its-kind biogas plant in the region in Al Sunaynah, which uses the waste from cows to produce gas that is used as alternative energy to operate some facilities at the factory.

The switch-on of the plant took place in the presence of Dr Hamad bin Saeed Al-Aufi, Minister of Agriculture and Fisheries in Oman and the Board of Directors.

The biogas plant is part of Mazoon Dairy's strategy to adopt environmentally friendly solutions and use waste to energy to enhance the efficiency of waste management. This is the first time ever that a dairy company in the region has adopted clean technology on such a scale, making Mazoon Dairy a forerunner in harnessing environmentally friendly solutions in the dairy sector. [\[Read More...\]](#)

(12<sup>th</sup> October 2019, Times of Oman)

## UPCOMING EVENT

### National

1. **Renewable Energy India Expo**  
18-20 September, 2019  
India Expo Mart, Greater Noida, India

### International

1. **Biogas Italy**  
5-6 March, 2020  
Milan, Italy
2. **Value of Biogas East 2020**  
17-18 March, 2020  
Toronto, Canada
3. **15<sup>th</sup> World Bioenergy Congress and Expo**  
20-21 April, 2020  
Berlin, Germany
4. **Masterclass in Biogas**  
7<sup>th</sup> May, 2020  
Brussels, Belgium
5. **Coastal Biogas Conference**  
27-28 May, 2020  
Neringa, Lithuania
6. **Expo Biogas 2020**  
3-4 June, 2020  
Lille Grand Palais, France
7. **International Conference on Anaerobic Digestion and Biogas**  
July 23-24, 2020  
Berlin, Germany
8. **Biogas America**  
23-25 June, 2020  
Las Vegas, United State