Success Stories of Advanced Biofuels for Transport

AGROGAS (2G BIOCNG), PRIMOVE ENGINEERING PVT. LTD., INDIA

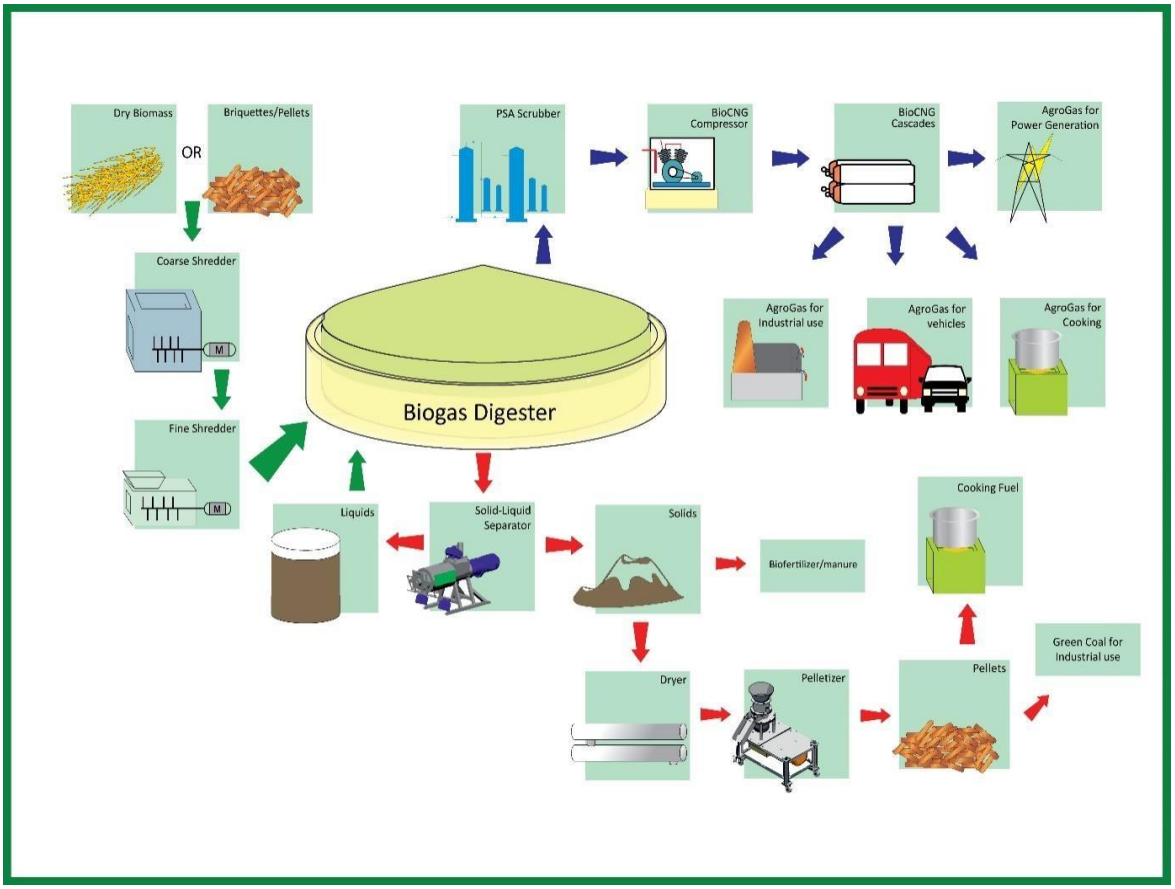
Year of plant start-up:	2016
Location:	Gat No. 271, Village Pirangut, District: Pune, State: Maharashtra, Country: India
Technology:	Anaerobic digestion to produce 2nd generation (2G) BioCNG from agro residue
Plant capacity:	AgroGas (2G BioCNG) of 100 kg/d i.e. 35 t/y max. Capacity
Operational experience achieved:	Approx. 5,600 hours; Operated daily since 14.08.2016 till date i.e. about 700+ days considering 350 days/annum. Total accumulated fuel produced > 30 ton
Total Capital Expenditure:	₹ 1,150 Lakhs[1], being first such pilot scale technology demonstration unit
Principle feedstocks:	Domestically available Agro residue with 10% moisture (rice straw/maize straw/sugarcane trash/cotton straw/soya trash/coconut frond/organic solid waste/bamboo/napier grass etc.)
Feedstock Capacity:	280 t/y, supply of feedstock is secured through various biomass aggregator sources identified
Products/markets:	Product: AgroGas (2G BioCNG) By Product: Digestate (bio-manure) 642kg/d i.e. > 250 ton till date Markets: AgroGas (2G BioCNG) fuel for vehicle filling and Digestate as manure for farm fields
Technology Readiness Level (TRL):	Technology is completely ready TRL 8 – system complete and qualified

[1] 1 Lakh INR = 100,000 INR = 1300 EUR

DESCRIPTION

Primove is a Pune based Technology Company working in the domain of gaseous fuels and energy. Produced exclusively from agricultural waste and plant material, AgroGas i.e. 2nd Generation BioCNG, also known as 'Fuel of the Future' is a much-needed, airtight invention from the labs of Primove. Patented and tested, AgroGas (2nd Generation BioCNG) is delivering a 3-fold socio-environmental impact – reducing carbon footprint, conserving fossil fuels and giving a sustainable entrepreneurial opportunity to the farmers thereby undoing the wrongs of fossil fuels. Primove has been the only company which has the technology today for processing any kind of agricultural biomass without any pre-treatment to produce second generation (2G) BioCNG that can be directly fed in vehicles. Primove has set up first 2G BioCNG plant in India at Pirangut in Pune which was inaugurated in August 2016 at the hands of Hon. Shri. Nitin Gadkari, Minister of Road, Transport and Highways and Hon. Shri. Manohar Parrikar, the then defense Minister.

If we initiate 5000 such 2nd Generation BioCNG plants across the country, then fuel import cost of ₹ 7 lakh crore[2] could be reduced to almost ₹ 3 lakh crore. If such plants are initiated in every village, then it can provide employment to at least 500 people from that community. In addition to this, AgroGas can prove to be a good import substitute as it is cost effective and pollution free. Our goal is to take the innovation of AgroGas plants throughout the length and breadth of India to ensure higher fuel substitution, more livelihood opportunities to the farmers and above all, reduction of carbon footprint, thereby lending a hand to the nation's goals of fighting the effects of pollution at a global level.



AgroGas Process Flow Diagram

[2] 1 lakh crore INR = 10,000,000 INR

Stakeholders involved:

- Farmers providing agro residue, Briquette manufacturers, Customers who fill AgroGas in their vehicles (users),
- Farmers utilizing digestate/manure in their farm fields,
- State Pollution Control Board (PCB) granting NOC for the plant,
- Petroleum and Explosives Safety Organization (PESO) granting approval and licenses to operate the plant

Financing Support:

Primove's pilot project has not availed any subsidy but Ministry of New and Renewable Energy (MNRE) has provision to grant a subsidy of ₹ 400 Crore for such plants generating 12,000 m^3/d Biogas

Contribution to Sustainable Development Goals:

Advantages offered by the project are as follows:

Small and marginal farmers who shall be able to sell their agro waste, which otherwise was being burnt thereby polluting the air, benefit from the project. This is an additional source of income for the farmers.

This project falls under the sustainable development goal of the World Bank and facilitates affordable, reliable, sustainable and renewable energy from biomass.

The project is Carbon Neutral as it is an inexhaustible and clean energy.

The project comes under the "Swachh Bharat Abhiyaan" of Hon. Prime Minister of India.

India has committed in the Paris Climate accord to reduce the greenhouse gas emission by production of energy from bio source instead of fossil fuel. The AgroGas (2G BioCNG) project is supporting the vision of the Government of India in the matter.

Production of AgroGas (2G BioCNG) on a large scale could potentially replace imported LNG/CNG, commercial LPG and all transportation fuels and thus save valuable foreign exchange.

Project will generate employment in rural area and supplement the agriculture income of farmers.

In line with all advantages mentioned above, the project contributes to following SDGs: Reliable, sustainable and modern energy for all (SDG7), regional development (SDG8) and promotion of sustainable industrialization (SDG9), sustainable consumption and production patterns (SDG 12), and GHG emission reduction (SDG13).

Contribution to GHG emission reduction in transports:

The AgroGas (2G BioCNG) unit at Pirangut, Pune is the first and the only such plant to have received approvals and licenses for its operation (under Form E&F for compression and filling of Compressed Bio Gas and under Form G for dispensing of Compressed Bio Gas under Gas Cylinders Rules, 2016) which utilizes agro residue to produce BioCNG for automobile filling.

The produced AgroGas (2G BioCNG) complies with purity specifications stipulated under IS 16087:2016 published by Bureau of Indian Standards (BIS) thus maintaining purity of methane > 90%.

Use of BioCNG arrests harmful tailpipe emissions. AgroGas technology has the potential to meet India's new climate plan – also known as its Intended Nationally Determined Contribution (INDC) announced at the COP21 i.e. reduction of emissions intensity per unit GDP by 33 to 35 percent by 2030 below 2005 level.

The organic carbon rich digestate goes back to farm fields to increase fertility of soil and give better farm yield.

The existing project has the potential to power 13 cars (8 kg/fill) or 25 auto rickshaws (4 kg/fill) or a combination of above to thus reduce GHG emissions by these vehicles.

Employment:

The plant employs 6 operators, 1 supervisor and 1 engineer.

Replicability and scale-up potential:

The AgroGas (2G BioCNG) has the potential to be scaled up to produce 5 Ton per Day (TPD), 10 TPD, 25 TPD, 50 TPD or even more of BioCNG per day depending on land & raw material (agro residue) availability and the potential to sell AgroGas.

The technology can be adapted for implementation at an international level.

Success factors:

- Biomass aggregation systems should be in place and a clear mandate from Central and State Govt. for centralized purchase of agricultural residue and prohibition on burning the biomass residue
- Sales avenues and facilitation by way of fertilizer companies buying digestate recovered from Biogas digester (which is a rich source of organic carbon)
- Free and fair open market policy for sales of BioCNG by the manufacturers of BioCNG in line with Parallel Marketer policy available for commercial LPG
- Due concessions under Income Tax act (at par with facilities available to new CGD and NG operators). Exemption of profits for certain years for IT under 80JJ(a) of Income Tax act

Initiative by Govt. Oil Companies for setting up BioCNG plants and making available retail sales outlets for BioCNG sales throughout the country

Constraints:	Technically there's no constraint for AgroGas project. It is one of the most beautiful technologies which gives good business, contributes to clean environment and is yet sustainable.
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More information:	www.primove.in http://www.primove.in/video.html

AgroGas being dispensed in Car

The ART Fuels Forum brings together 100 experts and leaders representing the alternative transportation fuels Industry to facilitate discussions, elaborate common positions on policy issues and identify market penetration opportunities and barriers for these fuels. The Forum is established and financed by the European Commission under the project name "Support for alternative and renewable liquid and gaseous fuels forum (policy and market issues)".

www.artfuelsforum.eu

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