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BRIGHT

THE BRIGHT UPGRADE OF ALL BIOGAS PLANTS

HIGHLY EFFICIENT MEMBRANE BIOGAS UPGRADING & CO_2 LIQUEFACTION

WWW.BRIGHT-RENEWABLES.COM

RELIABLE

EXPERIENCE

QUICK TO GRID

PROFITABILITY

CO_2 LIQUEFACTION

NO CHEMICALS
NO WASTE / WATER

GAS TREATMENT

MODULAR & PROVEN BIOGAS UPGRADERS

Proven membrane technology achieving more than 97% operational availability. The PurePac biogas upgrader is easily integrated with any biogas plant, provides optimal gas cleaning, a robust design, an advanced patented control system and the assurance of 24/7 service support.

Having constructed the world's first commercial plant for upgrading biogas using a 3-stage membrane system, Bright successfully uses this proven design in its systems operating today.

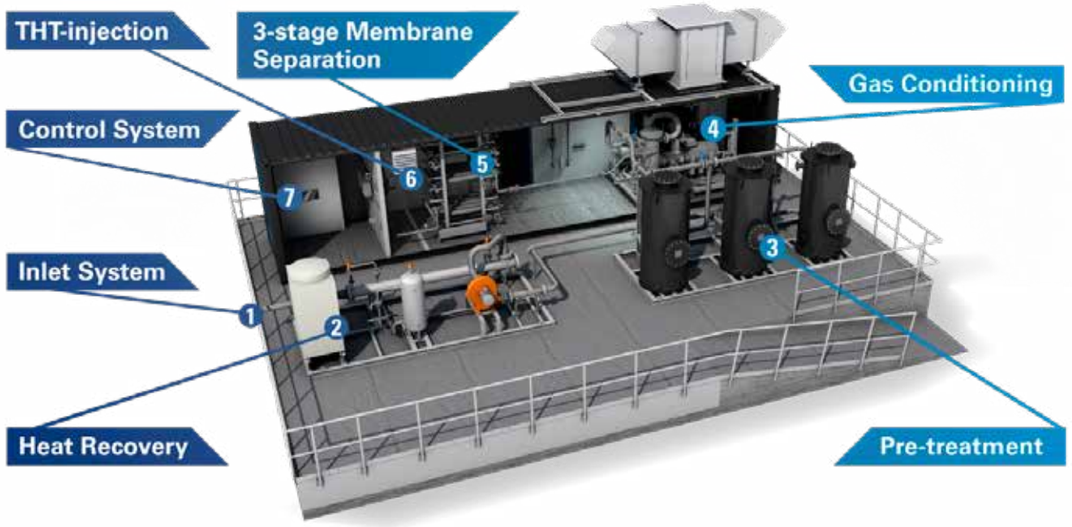
The advanced design and patented control system makes it possible to inject specification compliant biomethane to grid within a few minutes of start-up. Another option is to use the gas as transport fuel (bio-CNG). Other technologies take longer to start up, resulting in methane losses and operational inconvenience. Bright plant operators have the option to stop and start the facility at their convenience with minimal methane loss and no wasted energy consumption.

99.5% methane recovery, more than any other system. The lowest electricity consumption (0.22 kWh/Nm³ biogas). No heat required due to heat recovery (> 0.25 kWt/Nm³ biogas) covering the main energy consumption of the biogas facility. Very competitive price level and low operation costs.

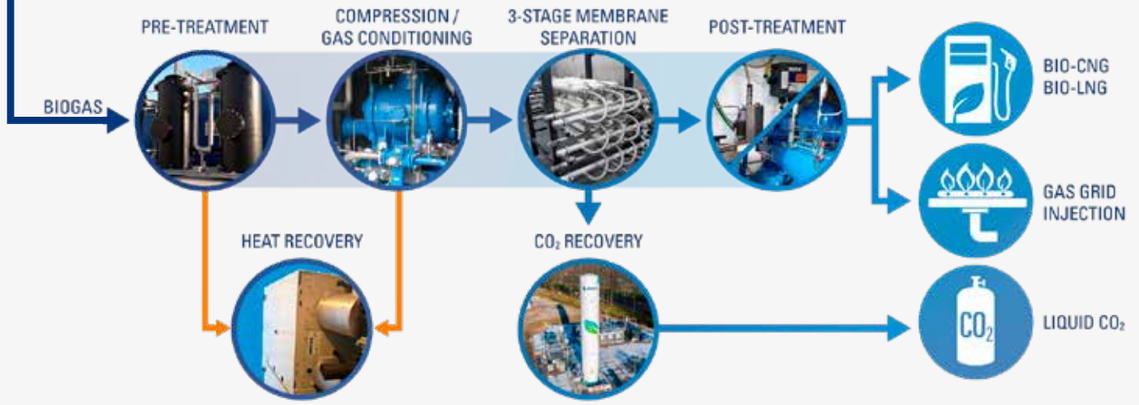
A CO_2 liquefaction system, with very low energy consumption, can be integrated with the 3- and 2-stage membrane upgraders to produce food-grade carbon dioxide (CO_2). A high-quality raw material of 99.9% purity that provides an extra source of revenue for the plant owner. The CO_2 liquefaction step reduces the methane slip to zero (99.99% recovery rate) as any remaining CH_4 returns to the upgrader.

No water or chemicals are needed in the Bright process which means that there are no disposal problems, such as acid water or chemicals that can be an unforeseen cost with other technologies.

Bright is experienced in managing biogas produced from any form of feedstock, including municipal sludges and wastes. Based on this experience, reliable biogas pre-treatment solutions can be offered to ensure the correct biogas specification is achieved before upgrading.



THE BRIGHT PROCESS



OUR TECHNOLOGY

Bright applies high-quality membrane technology that achieves more than 97% operational availability, highest separation efficiency and the lowest methane-slip. After the pre-treatment, compression and gas conditioning, the gas is separated in the 3-stage membrane unit by means of an imposed pressure difference over the membrane. Two gas streams are obtained: a product gas with a high methane value, and a CO_2-rich gas. As a result of highly selective membranes and the recuperation of methane, the highest possible methane yield is achieved. Depending on the application, the gas is upgraded to the preferred methane value.

FLEXIBLE APPLICATIONS

The methane-rich product gas can be used for different purposes. Any desired gas quality and calorific value is possible and can be fed into both the low- and high-pressure natural gas grid. Application as transportation fuel (bio-CNG/-bio-LNG) is another option. Virtual pipeline technology is extremely suitable for biomethane production at a remote site with no gas grid injection point. The produced gas is then transported to a nearby injection point. In all applications the patented 3-stage separation process ensures that the gas meets the requirements for the specific application. The residual heat and the CO_2 can also be utilised.

A BRIGHT IDEA FOR THE PERFECT BIOGAS UPGRADING SOLUTION.

BRIGHT SOLUTIONS

Bright is a global industry-leader of biogas upgrading systems. Our **premium and proven PurePac systems** offer a complete biogas upgrading solution starting at 100 Nm³/hr biogas flow capacity.

Easily integrated with all types of new and existing biogas plants in any industry, and suitable for landfill gas and biogas produced from any form of waste, including municipal sludges.

Bright's product and technology portfolio includes standardised containerised biogas upgraders, CO_2 liquefaction technology, virtual pipeline, service support and predictive maintenance, and bio-CNG and bio-LNG applications in addition to biomethane. Outside of its headquarters in the Netherlands, Bright has worldwide offices, local agents and partners, and realised projects in over 20 countries across four continents. For our systems supplied, Bright has 24/7 local maintenance teams in several countries.

PurePac Grand with CO_2 liquefaction system

1,200 Nm³/hr biomethane from food waste, sludge

WAALWIJK, NETHERLANDS

At this anaerobic digestion facility, our large-scale upgrader produces 10 million Nm³ of biomethane per year from 30 different waste streams. The CO_2 liquefaction system produces food-grade CO_2 for industry sales.

PurePac Medium with virtual pipeline

450 Nm³/hr biomethane from manure

WARSAW (NY), USA

The produced renewable natural gas at this remote farm, without gas grid injection point, is compressed and delivered to a nearby gas grid injection point (bio-CNG/bio-LNG filling station) using Bright's virtual pipeline technology.

PurePac Compact with grid injection

250 Nm³/hr biomethane from municipal sludge

SLEEUWIJK, NETHERLANDS

From feces and sewage sludge waste to biomethane-to-grid. This wastewater treatment plant with a compact build biogas upgrader produces enough biomethane for the gas needs of 1,500 households.

PurePac Mini with bio-CNG filling station

35 Nm³/hr biomethane from manure

HOUFFALIZE, BELGIUM

This small-scale biogas to bio-CNG upgrader with directly connected filling station, produces bio-CNG for the farm's own fleet, allowing the company to become fuel self-sufficient and independent of fluctuations in fuel prices.

CONTACT

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Visit our website for more information and follow us on social media to stay updated.

BRIGHT

CO_2 LIQUEFACTION TECHNOLOGY

Food-grade CO_2 | extra source of revenue

- Use of systems own CO_2 as recycled refrigerant
- Decrease of carbon intensity score
- Reduction of methane slip & carbon emissions

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FOOD-GRADE QUALITY LIQUID CO_2

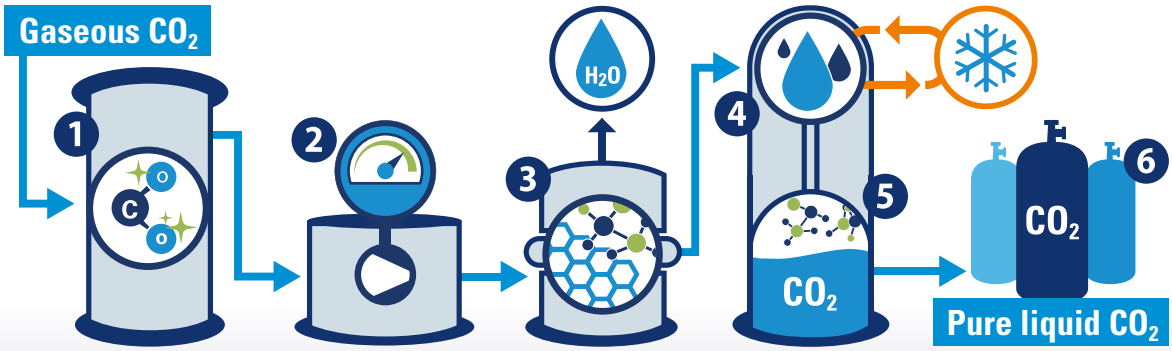
Useable in a range of industries

By extending the Bright system with a CO_2 recovery module, the gaseous CO_2 that is produced during the upgrading is liquefied. This liquid Bio-CO_2 of food-grade quality can be used in various industries, including:

- Greenhouses
- Refrigeration installations
- Food and beverage industry
- Slaughterhouses

BRIGHT CO_2 RECOVERY TECHNOLOGY

This is how we do it



1. The CO_2 is filtered through an activated carbon filter in order to purify it.
2. A non-lubricated compressor pressurizes the CO_2.
3. Moisture such as H_2O is removed in the automatic molecular sieve.
4. The liquefier removes all traces of non-condensable gases from the CO_2.
5. Entrained non-condensables (oxygen, methane and nitrogen) are removed in the stripping tower.
6. The CO_2 flows into an insulated storage tank.

PROJECTS

Bright systems equipped with the CO_2 recovery module have proven to be a successful extra source of revenue in these projects. For more information about Bright projects visit our website.

TILBURG, NL

CAPACITY: 1200 kg/hr

CO_2 PURITY: >99.97% *(food-grade)*

HEREFORD, UK

CAPACITY: 850 kg/hr

CO_2 PURITY: >99.97% *(food-grade)*

WAALWIJK, NL

CAPACITY: 600 kg/hr

CO_2 PURITY: >99.97% *(food-grade)*