

FAQs BTW

BIOGAS AND BIOMETHANE

1. What is Biogas?

Biogas is a natural gaseous fuel. It is obtained from anaerobic digestion by bacteria, as a product of the fermentation of substances of organic origin, both animal and vegetable. This takes place inside special digesters.

Biogas is converted into electricity and thermal energy in cogeneration plants, or into biomethane in biogas upgrading plants used directly to replace fossil methane.

2. What is Biomethane?

Biomethane is a natural and renewable gas which results from the biogas improvement process known as upgrading. This is based on membrane technology or, alternatively, on PSA (Pressure Swing Adsorption) technology and chemical scrubbing.

Biomethane is used to **feed** the existing grid, as a substitute **for natural gas, and to fuel vehicles.**

3. What is Digestate?

Digestate (or "digested sludge") is the liquid or solid material that remains at the end of the biogas process. It contains nitrogen, phosphorus, potassium, calcium and other elements and is used as a fertilizer or soil improver. The presence of mesophilic bacteria in the digestate is a significant enhancement of its ability as a biofertilizer.

4. What waste can be treated in a biogas plant?

Any type of organic waste can be treated. Waste from **livestock farming** (slurry, manure and feed waste), from **agriculture and food production** (fruit and vegetable waste, meat, fish and milk processing waste, beer waste, and food waste); wastewater from agro-industrial and municipal **sewage treatment** plants, and from the **organic fraction of Municipal Solid Waste.**

5. What are greenhouse gas emission reduction Certificates of Origin?

Certified Emission Reduction Certificates are an international mechanism for monetizing reductions in pollutant emissions into the environment; this is one of the three mechanisms proposed in the Kyoto Protocol for the reduction of emissions that cause global warming and the greenhouse effect. Biogas generates this type of emission reduction certificates.

6. Can only one type of waste be treated in a biogas plant?

One of the great advantages of this technology is that waste can be mixed; they do not have to be treated separately. Furthermore, mixing waste provides a higher level of energy. This factor is extremely advantageous when dealing with small quantities of each waste.

7. What is the minimum size of biogas plant that can be installed?

A biogas unit can be installed for plants from 100 kW upwards. The technology is modular to suit the needs of each client.

PLASMA

1. What is plasma?

Plasma is the fourth state of matter after solid, liquid and gas. It is an extremely hot gas charged with electrons. Examples of plasma are fluorescent tubes; air when lightning strikes; or the gas in plasma televisions.

2. What is plasma conversion technology for waste treatment?

It is based on the creation of an intense energy field (plasma) creating an atmosphere of more than 5,000 °C to achieve molecular dissociation of solids, liquids and gases.

No emissions are produced, and no ash is formed at all. The products obtained are:

- Synthesis gas, whose fundamental composition is CO and H2.
- Vitrified silicate: in the case of most of the inorganic matter, especially heavy materials, an inert vitrified material is formed.

3. How does this differ from waste disposal by incineration?

INCINERATION	PLASMA ARC CONVERSION
The waste burns.	The waste separates into its constituent atoms at a temperature of more than 5,000°C.
Energy is obtained by utilizing the heat produced in the combustion.	By recombining the atoms, a highly versatile synthesis gas is obtained for material and energy recovery.
The exhaust gas complies with the RD 773/2017 standard for industrial emissions.	The synthesis gas complies with the RD standard for industrial emissions, as it is below the limits by several orders of magnitude. The high temperature of the process completely prevents the formation of dioxins and furans.
It is a process that generates large volumes of air and gas.	Plasma technology works with one tenth of these volumes of gas and air.
Incomplete combustion products are possible.	Due to the design of the system, it is impossible to prevent the residue from passing through the plasma arc, and therefore everything separates.
After combustion, fly ash is produced.	An inert vitrificate is produced.
Greenhouse gas (CO2) emissions.	CO2 emissions are reduced by 400% compared to incineration.

4. How does this contribute to sustainable development?

The Plasma Conversion System is a safe, closed system with no negative impact on the environment and helps to address the growing waste problem.

- It is designed to avoid any emissions or discharges.

· Depending on the volume and composition of the waste to be processed, syngas recovery can be configured to produce:

- _Electricity from hydrogen.
- _Chemical products such as methanol, diesel, etc.

It contributes to sustainable development: energy and useful products (synthesis gas and silicate) are obtained from resources such as waste.

5. Where are there Plasma Conversion plants?

Plants based on plasma arc technology have existed since the second half of the 20th century. Their main uses have been the vitrification of fly ash and ash from incinerator floors; the treatment of military waste and industrial waste, whether toxic and hazardous or non-hazardous. There are numerous such plants around the world, mainly in Japan, but also in the USA, France, Canada, Norway and the UK.

6. If it is so good, why hasn't it been applied to waste before and on a massive scale?

Plasma has long been the Best Available Technique for various types of hazardous waste. For MSW (Municipal Solid Waste) tenders have favored cheap systems such as landfill, although highly polluting, or incineration. The new environmental awareness of pollution has developed a legislative and economic environment that favors recycling, whether mechanical or chemical, and the production of clean energy. Therefore, the reason why the conversion of waste by plasma has not been massively developed is due to the lack of the abovementioned legislative framework and a favorable economic and social environment.

7. What kind of waste can be treated in a plasma plant?

In a plasma conversion treatment plant, all types of waste can be treated, from MSW (Municipal Solid Waste) to hospital and hazardous waste. Each plant is designed and built for the conversion of a specific type of waste, and subsequent application of the synthesis gas (methanol, hydrogen and electricity).

8. If the number of tons to be treated increases, how does this system grow? Does a larger one have to be built?

No, the system is modular, therefore the necessary modules can simply be added to reach the new capacity.

SEWAGE TREATMENT

1. What is the treatment process for the sludge produced during sewage treatment?

It is essential to treat the sludge produced during sewage treatment. If it is not treated properly, among other things, it produces bad odors; large quantities of waste that are difficult to treat; insects and other animals; filtration of heavy metals and pathogens into the soil; high treatment and maintenance costs, as well as the cost of transportation and added pollution.

The most common biological treatments are anaerobic digestion, aerobic stabilization and composting.

2. What are the advantages of G-Tech Technology?

The G-Tech technology for biological sewage treatment is based on a Vertical Reactor with biological oxidation and physical attack through bacterial lysis. The treated water is sanitized before discharge.

3. What are the advantages of G-Tech Technology?

Among its main advantages are the reduction of the resulting sludge by 50 to 80%; less noise and fewer odors, even when located on top of the installation; and at least 50% lower purification costs, 70% lower maintenance costs, and 30% lower electricity costs.

4. How much space is needed to install a G-Tech technology treatment plant?

The installation is underground, and the space required is 70% less than for a traditional installation. In addition, as it does not produce odors, it can be installed right in the center of the town. This system can increase the capacity of an existing plant by 300% without the need for any additional space.