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([INNOVATION](#) - [Patents and Projects](#), with relevant BPs and StartKit Commercial Offers)

JWTeam - http://www.expotv1.com/ESCP_NUT_Team.pdf

Offers extensive support on [Energy and Water Cycle](#), verse [IP S DGs /UN](#)

Summary – Applications (to SDGs)

[MBGC https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016092582](https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016092582)

Biogas - generate high purity raw materials from organic matrices. MBGC is dedicated to the disposal and reconversion of organic waste , both from excrement (human and animal) and from manufacturing processes (agri-food industry), as well as in many agro-zootechnical activities. Very compact system that uses only renewable energy, with high energy recovery indices and production of high quality by-products (CH₄, CO₂, NPKx , H₂O). Excellent solution for urban areas for contrast to the disposal of wastewater and containment of interventions on its infrastructures (sewerage transport networks and purifiers), acting in a distributive /pervasive manner where the problem arises. It offers significant contrast to the load Organic contributing to the performance on " **Water cycle** " .

Project: MBGC - MiniBioGasContinuous

Objective : Launch a pre- assembly and testing site (procedures and manuals) for the production of MBGC tanks

Target: Prefabricated (CLS) companies, hydromechanics , financial investors, operators in the BioGas / BioMethane sector

The project aims to activate a production site, from design to assembly (pro delivery and rapid assembly), with the development of production-oriented procedures agreed with the client (based on the products available for supply) and destinations of the outputs produced. The solutions rely on standard products from the water management and prefabricated market, assembled and tested with a view to optimize linear anaerobic digestion, with selective and corrective extraction. In collaboration with internal and external laboratories, it will act as remote support for the installations in charge (EPC - Engineering , Procurement and Construction).

Summary: This is a method for anaerobic digestion and a device for its implementation. Anaerobic digestion is a biological process that breaks down organic matter in the absence of oxygen, producing biogas, fertilizer and water. Biogas is a mixture of methane, carbon dioxide and other gases that can be used as a renewable energy source. The fertilizer is composed of nitrogen, phosphorus and potassium salts (NPKx salts) which can be used to enrich the soil or supplement supplies from specific industries. Water is the liquid fraction that can be reused or discharged after treatment.

A device to implement this method consists of a tank divided into different areas, where different phases of anaerobic digestion take place. The tank is equipped with bulkheads, pipes, pumps, heating means and gas separation means. The organic matter enters the tank through a vertical inlet pipe (in homogeneous diffusion mode) and undergoes the following phases:

- 1) Hydrolysis: organic matter is divided into smaller molecules by means of water and enzymes;
- 2) Acidogenesis : the hydrolyzed products are transformed into volatile fatty acids and other compounds by acidogenic bacteria .;
- 3) Acetogenesis : volatile fatty acids and other compounds are further transformed into acetic acid, hydrogen and carbon dioxide by acetogenic bacteria;
- 4) Methanogenesis : acetic acid, hydrogen and carbon dioxide are transformed into methane and carbon dioxide by methane genic bacteria;

The liquid mixture flows through the tank from one area to another, following a path defined by the bulkheads and pipes. Along the way, some pumps recycle some of the liquid mixture to optimize the process. In the last zone, the liquid mixture separates into different components by gravity:

- a) Oleic phase: the lighter fraction which mainly contains fats and oils , is drained and brought back to the beginning;
- b) Protein phase: the heavier fraction which mainly contains proteins and amino acids, not yet treated, is taken and brought to the beginning;
- c) NPK salts: the solid fraction that precipitates at different levels according to their solubility and specific weight;
- d) Clarified water: the clear fraction that remains after the separation of the other components is expelled by gravity and thermally pre-treated in the last part of the tank at half level;

The gases produced during the process (methane and carbon dioxide) rise towards the top of the tank, where they separate by density and start non-specific functions. Carbon dioxide, being heavier, remains in the lower part of the space above the liquid surface, while methane, being lighter, moves towards the upper part of the space. Gases are extracted through pipes with holes that are connected to gas storage or utilization systems. The device also includes a lighting and cooling system to prevent the formation of hydrogen sulfide, a toxic gas that can result in anaerobic digestion, damaging it. Lighting stimulates photosynthesis in some bacteria that consume hydrogen sulfide in the absence of oxygen. Cooling condenses water vapor in the gas phase and returns it to the liquid phase .

[SDGs / UN en](#) - [SDGs / UN it](#)

Full Strategy to [1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17](#) [SDGs/UN](#) - http://www.expotv1.com/ESCP_Hello.htm