
ADAPTING AN ENERGY SYSTEM MODULATED THROUGH THE BIOGAS ENGINE

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ABSTRACT:

This study is generally based on the modulation energy system using a biogas plant production. The main aim of the study is to make a proper way of biogas plant and the production of the biogas must be done in the plant. The working of the biogas is mainly based on the principle of conversion of the energy. The biochemical energy is generally converted into a homogenous fuel and used in the various kinds of internal combustion engines.

LITERATURE REVIEW:

The study done in this paper is mainly focused on the energy system which is created through the help of a biogas plant and its construction. The energy then produced can be used for various purposes, as the energy system stored the collected energy and has the tendency in the conversion of energy from one source to another.

THE CONSUMPTION OF THE BIOGAS ENERGY IS CAN BE DONE IN VARIOUS FORMS, SUCH AS:

- Energy source is very important in the production of the biogas.
- The generated gas is converted into the homogenous fuel and is used in various internal combustion engines
- Reliability of this gas makes it a very economic based fuel.
- The size of the plant matters the most in the production of the biogas.
- The operation of the biogas production is done inside the plant.
- The produced biogas has a various fluctuating properties which are based on the input energy of the plant.

ENERGY SYSTEM USING BIOGAS PLANT:

Fig.1 the diagram shows the construction of the biogas plant in a very clean way. It consists of - waste (urine, and other) collector tank, settler of the biogas, anaerobic reactor, and the constructed wetland.

This biogas reactor is used at domestic level and clearly explains the slurry materials and the digestates inside the tank. The inlet of the pipe makes a way towards the tank and outlet for the gas to flow.

a biogas reactor is an airtight chamber that facilitates the anaerobic degradation of blackwater, sludge, and/or biodegradable waste (e.g. animal manure, kitchen and garden wastes). It also facilitates the collection of the biogas, a mixture of methane (CH_4) and carbon dioxide (CO_2) produced in the fermentation processes in the reactor.

The gas forms in the slurry and collects at the top of the chamber, mixing the slurry as it rises.

The pressure exerted by the rising gas can be used to transport the gas to the collection vessel or directly to where it is going to be used. The digestate is rich in organics and nutrients, almost odourless and pathogens are partly inactivated

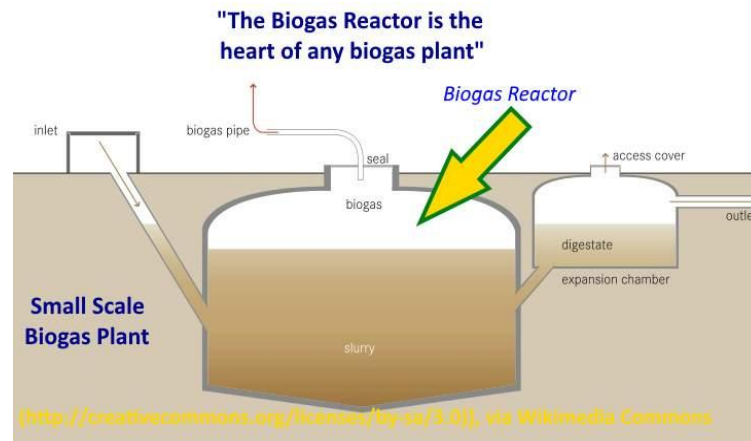


Fig. 2 Small Scale Biogas Reactor

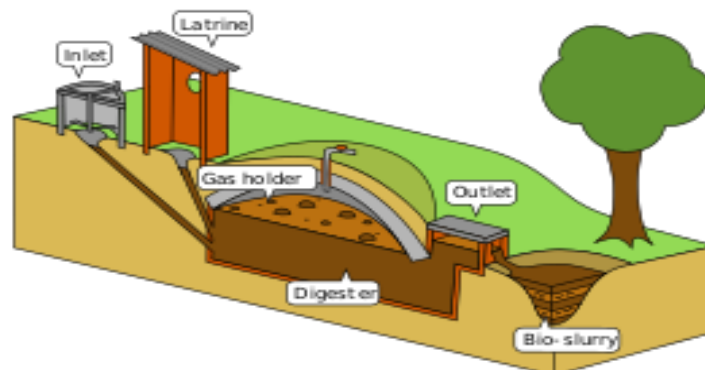


Fig . 3 diagram of simple production of the biogas which is generally used at a small scale and the energy used in multiple purposes.

MODULATION OF THE BIOGAS PLANT INTO AN EFFICIENT ENERGY SYSTEM

The several modifications should be done in the biogas plant so that the biomethane gas which is produced after the removal of hydrogen sulphide and carbon dioxide from the biogas. To facilitate the plant with respect to the biogas production, purified form of methane must be present. Through this, the fuel based gas is obtained in the process of anaerobic digestion in the biogas plant. The plant is connected with a mechanical device or an electrical device so that the energy which is produced can be utilized in various other forms. This whole process of production of biogas, making it a good calorific value fuel, conversion of this fuel into a burning fuel and the utilization of the energy through various forms requires a good amount of wastage material for biogas production, a cost efficient plant and a source of energy absorption. This below figure shows exactly these all processes.

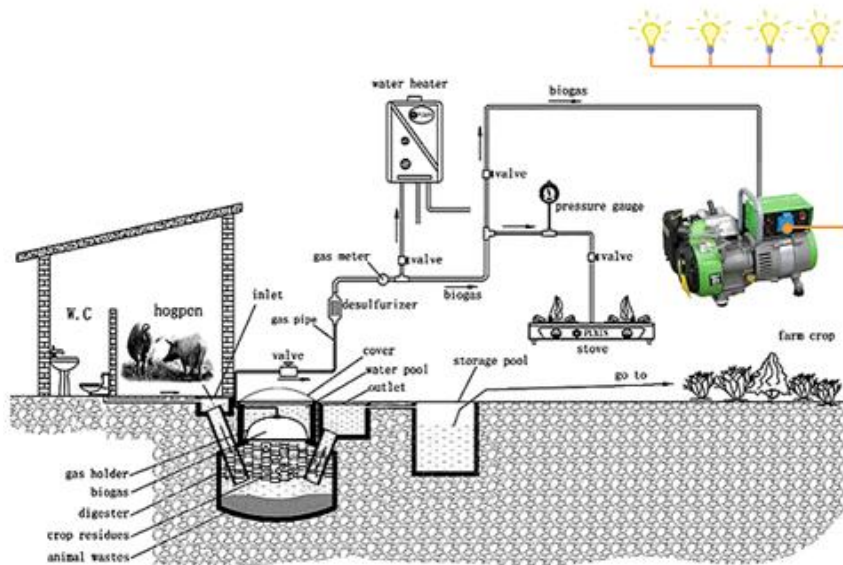


Fig.4 the diagram shows the modulation of the biogas plant into an energy system using the biogas as a fuel and can be used in various applications after that.

INVESTMENT COSTING OF THE ENERGY SYSTEM THROUGH THE BIOGAS PLANT:

The various factors which affect the operational costing of the biogas energy system are as follows:

- The size of the biogas plant ensures the costing effect.
- Civil workings of the plant also depends on the pricing
- Selection of the engine
- Instrumentations used in the engine
- Modifications of the engine
- Transmissions done throughout the plant
- The biogas plant is modulated into an energy system so that it could easily sustain the costing effect
- The equipment which are used in the biogas plant must be of good quality so that it could become so much easy for the reliability of the plant
- The production depends on the operation the plant
- The production of the plant can be automatic, so that there could more efficiency of the plant.
- Servicing of the plant must be done time to time so that there could be fewer problems in the plant.
- Energy production through this whole system can be used widely in various fields.

CONCLUSION:

The study focuses on the production of the biogas from the biogas plant and after the production done, it is transferred to the energy system linked to the plant and can be used frequently. This energy produced is used in various kinds of machines related to the mechanical or electrical.

The modulation of the newly made energy system is the one way process through which the collected energy is used in other forms also.

SUMMARY:

The author in this paper describes about the versatility of the biogas engine that it can be used in various kinds of fields such as the mechanical devices, electrical devices as well as the thermal devices. The main objective of this research is mainly depends on the versatile nature of biogas production in the biogas plant and make it a very homogenous and efficient fuel. The conversion of the biogas into a biomethane gas makes it very reliable in terms of making an energy system which is based on the modulation of biogas plant.

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