

Website: https://academiaone.org/index.php/7



## Geothermal Energy Sources and Biogas Applications in Science

Siddikov Rasuljon Oktamovich Head of the Department of Engineering Technologies of T DTU QF Mirzayev Islombek TDTU QF student mirzayevislombek 06@ gmail. com Khusanova Sarvinoz T.M.J "Technological machines and equipment" 2.21 Bakhriddinova Dilnora M.Ya.M.T "Materials science and technology of new materials" 3.21

Abstract. In this article, opinions were expressed about the application of biogas to science and geothermal energy.

Key words: biogas, electricity, heating, biochemical supply, energy

**ISSN (E):** 2810-6458

Biogas is a renewable energy source that has gained popularity in recent years, particularly in rural areas and developing countries. Biogas results in the anaerobic digestion of organic waste such as manure, sewage and food waste. The gas produced contains methane, which can be used as a fuel for heating and electricity. In this article, we will consider the role of biogas in the energy system, its biochemistry and disadvantages.

The role of biogas in the energy system

Biogas has several uses in the energy system. One of the primary uses is to generate electricity. Biogas can be burned in a generator to produce electricity, which can then be used to power homes, businesses, and communities. This is especially useful in rural areas where access to electricity is limited. Biogas can also be used for heating as a substitute for natural gas or as an alternative to traditional heating fuels such as coal or wood.

In addition to its role in electricity and heating, biogas can also be used as a transport fuel. Biogas can be compressed and used as a substitute for natural gas in vehicles, or it can be refined and used as a substitute for diesel in heavy-duty vehicles.

Biochemistry of biogas

Biogas is produced through a process called anaerobic digestion. This is a natural process that occurs when organic materials decompose in the absence of oxygen. In the case of biogas, organic waste such as manure, sewage and food waste is placed in an anaerobic digester, which is a sealed container that allows the organic material to decompose. As organic material decomposes, it produces methane gas, which is captured and stored for use as fuel.

The biochemistry of biogas production is complex and involves a number of different microorganisms. These microorganisms work together to break down organic material and produce methane gas. The process requires certain conditions to be met, such as the correct temperature, pH and humidity levels. If these conditions are not met, the process will not work efficiently, the quality and quantity of the produced biogas will decrease.





## Disadvantages of biogas

Although biogas has a number of benefits, there are also some disadvantages to consider. One of the main disadvantages is that the amount of biogas that can be produced is limited by the amount of organic waste available. This means that biogas is not suitable for large-scale electricity supply or heavy-duty transport without a constant supply of organic waste.

Another disadvantage of biogas is that the production process can be complicated and requires special knowledge and equipment. This can make it difficult for small-scale producers to engage in biogas production. In addition, the investment required to set up a biogas production system can be significant, making it difficult for some communities or individuals to access.

Biogas is a gas produced in the natural environment or in special devices. It is a product of biological decomposition reactions of organic substances. They are usually produced in landfills because all deposited organic matter decomposes. When said organic matter is exposed to external influences, it is destroyed by microorganisms such as methanogenic bacteria (bacteria that grow in the absence of oxygen and feed on methane gas) and other factors.

In this environment where there is no oxygen and bacteria consume organic matter, their waste is methane gas and CO2. Therefore, the composition of biogas is a mixture of 40% and 70% methane and the rest CO2. It also has other minor gases such as hydrogen (H2), nitrogen (N2), oxygen (O2) and hydrogen sulfide (H2S), but they are not major.

Biogas is produced by anaerobic digestion and is very useful for treating biodegradable waste because it produces valuable fuel and waste water that can be used as a soil conditioner or general compost.

Electricity can be produced with this gas in various ways. The first is the use of turbines to move gas and generate electricity. Another is using gas to generate heat in furnaces, stoves, dryers, boilers, or other combustion systems that use gas.

Since it is produced by the decomposition of organic matter, it is a type of renewable energy that can replace fossil fuels. With this, you can get energy for cooking and heating as if natural gas works. Similarly, biogas is connected to a generator and creates electricity through internal combustion engines.

## Summary

Biogas has the potential to play an important role in the energy system, particularly in rural areas and in developing countries with limited access to electricity and heating. Although there are some limitations and drawbacks to consider, biogas can offer a low-carbon, renewable energy source that can help reduce greenhouse gas emissions and combat climate change. As technology continues to improve, it is likely that biogas will become an increasingly important part of the energy system in the future.

## **References:**

- 1. Развитие рынка биотоплива в мире и в Российской Федерации / Российское энергетическое агентство. 2012. 324 СЕЛЬСКОХОЗЯЙСТВЕННЫЕ НАУКИ И АГРОПРОМЫШЛЕННЫЙ КОМПЛЕКС
- 2. Альтернативная энергетика [Электронный ресурс]. М., 2008. Режим доступа: http://www.medianapm.ru/biogaz.htm.





- Website: https://academiaone.org/index.php/7
  3. Веденев А.Г., Веденеева Т.А. Биогазовые технологии в Кыргызской Республике.-Бишкек: Типография «Евро», 2006. - 90 с.
- Эдер Б., Шульц Х. Биогазовые установки: практическое пособие [Электронный ресурс].
   1996. Режим доступа: http://zorgbiogas.ru/upload/pdf/ Biogas\_plants\_Practics.pdf.
- 5. Гюнтер Л.Л., Гольдфарб Л.Л. Метантенки. М.: Стройиздат, 1991. 128 с.
- 6. Баадер В., Доне Е., Бренндерфер М. Биогаз: теория и практика. М.: Колос, 1982.- 148 с.