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Ecological Features of Biogas Production

Meliyev Muzaffar Saidakbarovich
Teacher of the Department of Geography
and Fundamentals of Economic Knowledge KSPI
meliyev.1984@mail.ru
Axmadjonova Zulxumorxon Nazirjon qizi,
Mo'vinova Shoiraxon Iqboljon qizi
Students of the Department of Geography
and Fundamentals of Economic Knowledge KSPI

Abstract this article is written about biogas production and its environmental characteristics, which is one of the ways of solving the energy problem, which is one of the problems of thermodynamics. The article also shows examples of the economic efficiency achieved due to the production of biogas in economically developed countries and their technologies.

Keywords. environmental safety, production, saving, problems, Energy Security, potential, industry, environmental problems, biogas, waste.

The Republic of Uzbekistan has sufficient energy resources for the production of electricity and heat, as well as for use in industry, agriculture and in all spheres of the economy and public life.

Currently, the volume of energy production exceeds domestic demand by 15-20%. The accelerated development of the fuel and energy complex has become a priority area of state policy. The electric power industry is the basic branch of the economy of the Republic of Uzbekistan and, having a certain production and scientific and technical resource, has a significant impact on its development. In recent years, Uzbekistan has been among the top ten countries in the world with the largest oil and gas production potential. Every year, since 1997, the country produces about 50 billion rubles. m3 of gas and 8 million cubic meters. A ton of oil is produced, ranking second and fourth among the countries of the Commonwealth of Independent States. Uzbekistan ranks eighth in the world in terms of gas production. Uzbekistan's energy sector has the highest potential in the Central Asian region. Over the past 30 years, the republic has received 55-60 billion rubles. kWh of electricity was generated, and the production capacity was increased by more than 3 times.

In the international average, Uzbekistan's conventional fuel reserves have a potential of about 14 billion tons. it has about a ton of conventional fuel. The volume of proven hydrocarbon reserves in the Uzbek mineral deposits in the world averages 594 million tons. barrels of oil and $ 1.9 trillion m3 is equal to gas.

It can be noted that the total balance of energy consumption in Uzbekistan over the past decade is natural gas-84-87%, fuel oil-11-8% and coal-3.5–4.4%. As you can see, the fuel does not optimally meet the requirements of energy security in the form of an energy balance. As you know, oil and gas reserves in Uzbekistan, as in other countries, are declining, which may take several decades, and coal reserves-more than 250 years.

Thus, given the low role of coal in the energy sector of Uzbekistan, it is necessary to be active to increase it.

For us, the main task should be the constant technical and technological renewal of production, the constant search for internal opportunities and reserves. Such new views and actions should form the basis of all our activities.

The most important direction of our internal capacities and reserves in this regard should be the gradual increase in the deep processing of rich mineral raw materials and plant resources on our land, as well as the expansion of the volume and range of production of products with high added value.In other words, we need to move to a new step-by-step processing system to turn raw materials into a product that is in high demand on the world market. The meaning and essence of this system is that at the first stage it means the primary processing of raw materials, that is, the production of semi-finished products, at the second-their transformation into finished materials for industrial production, and at the third, final stage-the production of finished products for consumption.

All over the world, the problem of developing fuel resources, using them as much as possible and efficiently, along with the fact that they are one of the main factors in the development of society, their use causes environmental problems that have a negative impact on the development of this society. As an example, in the 1900s in London, Great Britain, due to the use of coal for heating homes, the level of atmospheric air pollution significantly exceeded the norm, and against this background, the first environmental law prohibiting the use of coal in residential premises appeared.

Over time, the importance of coal in the fuel and energy balance has somewhat decreased and its place has been taken first by oil, and then by natural gas, although the reserves of these fuels are also limited. At the same time, these types of fuels in the process of use emit a huge amount of toxic gases and other waste into the nature. Taking into account such features as cheaper production, a limited supply of energy resources and environmental degradation, the time for the use of biogas in the fuel and energy system has already come.

Biogas is a mixture containing 50-80% methane and 20-50% carbon dioxide. Biogas is similar in description to natural gas. Biogas has synonyms such as methane gas, sewer gas, or swamp gas. The caloric content of biogas ranges from 6000 to 9500 kcal / t. Biogas as a separate device was one of the first to appear in China, India, Assyria, and Iran in the XVII century BC. A scientific and practical study of the first order was carried out in the XVIII century. In 1764, Benjamin Franklin in his letter to Joseph Priestley

New Jersey says smoke coming from a swamp under a lake is burning. The first scientific work on the presence of combustible gases in swamps and lakeswas given by Alesandra Volta in 1776. The first practical work on this topic was Dalton's discovery of the methane gas formula in 1804. In 1875, Popovhe found that there is an influence of temperature on the formation of biogas. He analyzed the content of marsh gas and found that at 6°C biogas begins to be released, and at 50°C the rate of release increases, calculating that it contains 65% methane, 30% corbanad anhydride, 1% hydrogen sulfide and N, hydrogen oxygen and carbon monoxide. V. L. Omelyansky studied in detail the nature of anaerobic fermentation and the bacteria involved in it. Soon after, in 1881, European scientists began experimenting with the use of biogas for heating and street lighting. Since 1895,

Exeter Square and street lights have been illuminated by gas produced in a closed container as a result of sewage fermentation. Two years later, the gas produced by the Bombay biogas plant was used as fuel for conventional engines. At the beginning of the XX century, scientific research was continued to increase the amount of biogas by increasing the fermentation temperature. In 1914-1921, German scientists Imhof and Planck received a patent for their new innovative work, implementing a bioreactor in a continuous heating system. Due to the increased demand for thermal energy in Europe during the First World War, biogas plants began to spread throughout the continent. But the biogas plants were still imperfect, but this problem did not prevent the development of biogas plants. In the 1930s, Busfella took an important step in this field by creating a mixture of organic waste and manure as bioreactive raw materials.

The birthplace of the first industrial biogas reactor, in England, in 1990, the city of London was able to cover all energy consumption in agriculture thanks to the reactors launched to produce biogas from wastewater. The bioreactor for waste water treatment, built in London, is considered one of the largest in the world. Over the past 30 years, the European experience has been transferred to the United States. In the United States, the first biogas plant for processing animal waste was built in 1939 and has been successfully used for 30 years. In 1954, the first municipal waste recycling plant for biogas production was built in Fort Dodge, Iowa, USA. Therefore, a 175 kW internal combustion engine was also installed to generate electricity by burning biogas. Currently, the number of installations that receive biogas from urban wastewater in the United States is more than one hundred, while there are thousands of installations that receive biogas from animal waste.

As can be seen from the above data, the production and use of biogas in economically developed countries has already reached the industrial level. The main reason for this, first of all, is the lack of energy and the urgency of environmental problems. Therefore, an increase in biogas production, even in our homeland, will help to increase the weight of energy production, reduce organic waste, the amount of which in nature is increasing day by day, and regulate urban wastewater.

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