RESEARCH AND DESIGN OF BSU

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Annotation

Biogas energy is a reliable and cost-effective alternative to mainline natural gas and centralized power supply. The use of animal husbandry, crop production, food and oil and gas industry waste and sewage for the production of biogas makes this type of energy not only a new type of energy, but also an assistant for the disposal of various types of waste. Nowadays, the task of developing and implementing biogas devices for gas supply systems is urgent.

The use of BGS, made according to the technological scheme proposed by us, can provide a guaranteed minimum of energy supply for remote urban and rural local consumers of Uzbekistan, mainly gas energy and partly electricity.

Аннотация

Биогазовая энергетика - надежная и экономически выгодная альтернатива магистральному природному газу и централизованному электроснабжению. Использование отходов животноводства, растениеводства, пищевой и нефте-газовой промышленности и канализационных стоков для производства биогаза делает этот вид энергии не только новым видом энергии но и помощником утилизации разных видов отходов. В наши дни, задача разработки и внедрения биогазовых устройств для систем газового снабжения является актуальной.

Применение БГУ, выполненных по предложенной нами технологической схеме, может обеспечить гарантированный минимум энергоснабжения для отдалённых городских и сельских локальных потребителей Узбекистана в основном газовой энергии и частично электроэнергией.

Keywords: *biogas, alternative energy sources, biogas plant*

Ключевые слова: *биогаз, альтернативные источники энергии, биогазовая установка*

Uzbekistan is currently paying great attention to the development and introduction of alternative energy sources, as evidenced by the Decree of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev dated September 9, 2022 No UP-220 "On additional measures for the introduction of energy-saving technologies and the development of low-power renewable energy sources

On measures for the further development of alternative energy sources", aimed at continuing research and experimental industrial developments in the field of alternative energy sources at a higher technical and scientific level, practical use, taking into account world experience, of individual solutions for the use of alternative energy sources in Uzbekistan, as well as the organization of domestic production of modern equipment and technologies for this area. In

the decree of the President of the Republic of Uzbekistan, along with other major decisions, special attention is paid to measures to deepen experimental and practical research in the use of solar and biogas energy, where special attention is paid to the development and implementation of pilot projects for the production of energy from alternative sources, the organization of production in the republic of appropriate equipment, components and materials, as well as their service services.

Biogas energy is a reliable and cost-effective alternative to mainline natural gas and centralized power supply. The use of animal husbandry, crop production, food and oil and gas industry waste and sewage for the production of biogas makes this type of energy not only a new type of energy, but also an assistant for the disposal of various types of waste. Nowadays, the task of developing and implementing biogas devices for gas supply systems is urgent.

In our country and all over the world, special attention is paid to the use of alternative types of energy, in particular biomass energy. This is due to the growing number of the population based on this growing demand for energy. worldwide, there is a rapid introduction of installations using alternative types of energy, but the success of the introduction of alternative energy sources mainly depends on the location and climate. Taking into account climatic and other conditions, we recommend implementing the following types of biogas plants in Uzbekistan. A distinctive feature of this biogas plant designed for medium and large farms is the presence of a special container for the preparation of raw materials, from where it is fed by means of a compressor into the loading hopper, and then with the help of compressed biogas - into the reactor of the installation. A part of the generated biogas is used to operate the heating system. The installation is equipped with an automatic selection of biogas and a gas tank for its storage. The presence of a heating system allows the biogas plant to be operated in all fermentation modes.

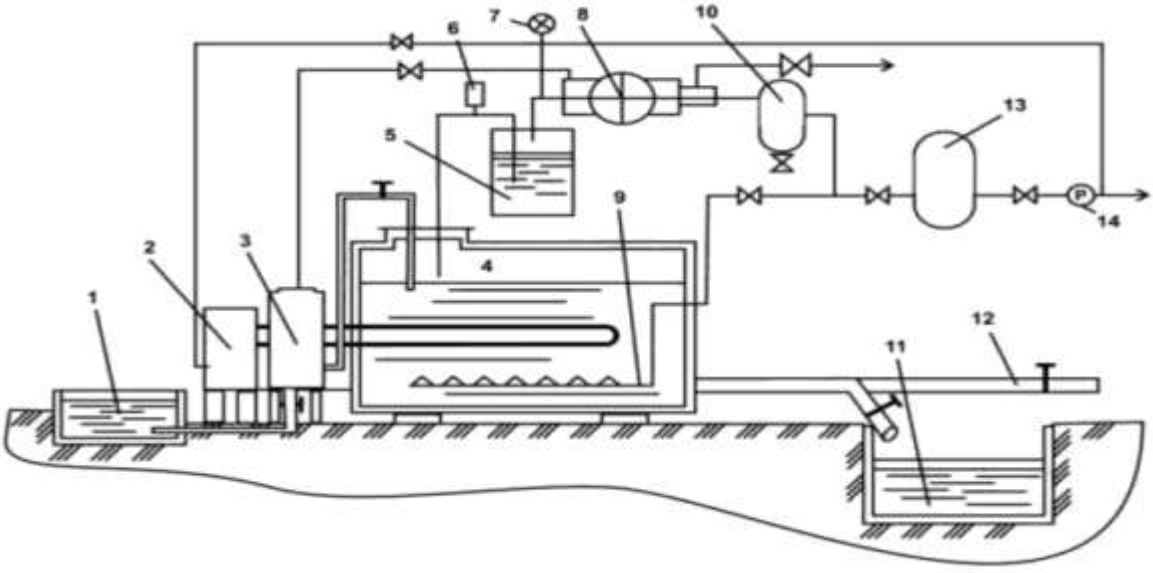

Fig. 1. Diagram of a biogas plant with a gas tank, pneumatic loading and mixing of raw materials, with heating of raw materials in the reactor:
1-manure receiver; 2-water heating boiler; 3-loading hopper; 4-reactor; 5-water gate; 6-safety valve; 7-electric contact pressure gauge; 8-compressor; 9- gas agitator; 10-receiver; 11-storage for biofertilizers; 13-gas tank; 14-reducer gas .

Despite the relative simplicity of the device and the many different biogas plants developed in

different countries, they are not widely used in most farms of our republic. The main reason for this is that the choice of the technological scheme for the implementation of the fermentation process in each case of the construction of a biogas system should be made taking into account a large number of factors that are specific to the specific location of the proposed installation. Specific factors are: the availability of sufficient quantities of a certain type of raw materials for fermentation, the availability of appropriate infrastructure to ensure optimal conditions for the process, and the factor of availability of technical and financial means for the construction of the installation from potential consumers of bioenergy installations in rural areas. It is also necessary to take into account the peculiarities of rural dispersed consumers due to poor quality or lack of centralized energy supply.

The main requirement for technological schemes and design solutions in the design of combined power plants is to ensure efficient energy supply entirely based on the use of renewable energy sources, in particular solar energy. At the same time, the necessary result must be achieved on the basis of an integrated approach, the essence of which is to simultaneously meet the potential energy needs of a biogas reactor and a guaranteed minimum energy supply to different farms in compliance with economic and environmental requirements.

Fig. 2. Scheme of mathematical modeling of a bioenergy installation.

Thus, mathematical modeling for the purpose of optimization technological and design parameters of the BSU should be carried out taking into account the fact that one of the key issues of creating autonomous biogas systems for dispersed remote rural consumers is the choice of a rational technological scheme of the BSU in accordance with the capabilities of a specific installation site. The use of BGS made according to the proposed technological scheme can provide a guaranteed minimum of energy supply for remote urban and rural local consumers of Uzbekistan, mainly gas energy and partly electricity.



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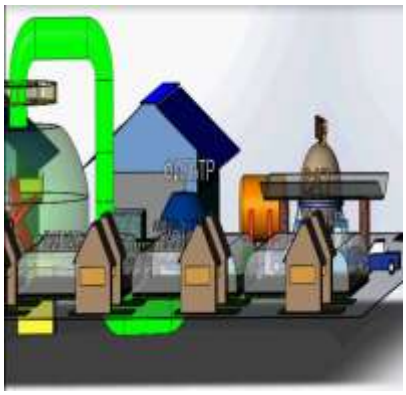
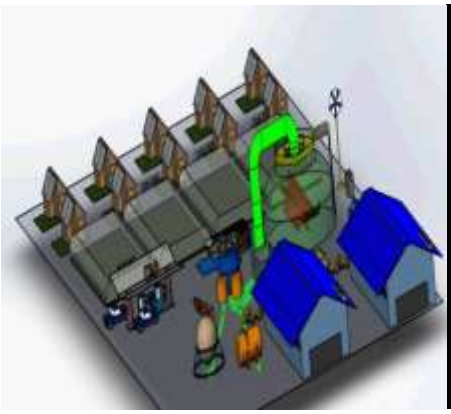
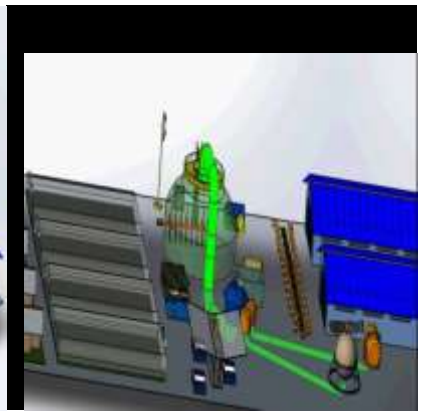

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