

УДК 631.22.018

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г. Казань

FEATURES OF APPLICATION OF BIOGAS TECHNOLOGIES IN AGRICULTURAL PRODUCTION

The article considers the peculiarities of biogas technology application in agriculture, processes and stages of biogas production. Types of raw material processing and the choice of the most optimal of them. The relevance of the work is presented. Anaerobic fermentation of organic fractions, resulting in the processing of which biogas, energy and fertilizers are formed, refers to resource- and energy-saving technologies.

To date, there is a rapid development of alternative energy all over the world. In Europe, the installation of biogas technology is widespread, which is a characteristic element in modernity because of the possibility of waste-free production of end products in the form of fertilizers and energy. Despite being a central aspect of production, for many countries the main interest is in the utilization of agricultural and organic solid waste.

There are several types of processing of these raw materials:

- composting;
- incineration;
- anaerobic fermentation [1].

In composting of organic raw materials, it is possible to extract nutrients substances, while incineration leads to their loss, but energy is obtained. The most rational way of processing is anaerobic fermentation, as it are a combination of energy and nutrient recovery.

Different types of organic feedstocks can be used in biogas plants organic raw materials. There is also a system of their storage, which can be in the form of tanks used for liquid waste, and when using solid waste, special rooms are built. In these closed rooms there is a system of air collection to perform the subsequent stages of processing [2].

When working with organic raw materials, additional biofilters are installed, which are necessary for the removal of organic waste, which are necessary to remove the outgoing unpleasant odor.

The main element is a fermenter designed for anaerobic fermentation. In its upper part or as a separate external device, a gas-tight storage tank is installed.

When operating a CHP plant, gas purification technology is mandatory in order to release sulphur compounds and water from the product [3].

But before it can be used, the gas must be purified from hydrogen sulphide to prevent corrosion and other metal elements, and to protect concrete and wooden structures from gas exposure. Having passed all stages of processing, digestate is sent to storage for further use. The organic sludge after the fermentation process can be improved by separation into solid and liquid fractions, drying, pelletizing and composting. To reduce the moisture content, it can be extracted by vacuum evaporation or membrane filtration, and nutrients by precipitation or treatment of wastewater or exhaust air by acid washing [4].

This can add value and lead to easier transportation. In order to obtain high quality products, it is necessary to ensure the normal operation of the bioreactor, ensuring the tightness of the tank, to maintain a constant temperature level, not allowing a sharp rise or fall, to maintain control of the heating system and stable operation of the stirrers, and feedstock supply. For the safe use of the plant it is necessary to have a proper technological implementation of the equipment.

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