Assessing Of Parameters Of Energy Supply Systems Of Mobile Homes Based On Renewable Energy Sources

Sultanov Samandar Yamgirovich Doctoral student of the Department of Alternative Energy Sources, QSTU. sultonovsamandar32@gmail.com

Davlonov Khairulla Allamurotovich

QSTU, Department of Alternative Energy Sources, Ph.D.

xayrulla.davlonov@bk.ru

Ziyodov Shahrukh Ubaydullo oglu

Master of Karshi State University

shoxruxziyodov314@gmail.com

<u>Ulugov Jonibek Bahodir oglu</u>

Doctoral student of the Department of Alternative Energy Sources, QSTU.

qudratovjonibeek@gmail.com

Abstract: In this article, the research of fuel energy supply systems of mobile homes based on alternative energy sources, as well as the possibility of obtaining liquid, solid and gaseous alternative fuels from the proposed combined pyrolysis - biogas device, and the use in autonomous heating systems of mobile homes, which are energetically and economically effective that it can be useful for different groups of people and situations, mobile homes provide comfortable and convenient living in steppe and desert areas, mobile home Fuel systems in a mobile home use a biogas plant and electricity from the main electrical panel. It is described as being similar to a traditional home with circuits, wires, sockets and switches.

Key words; Mobile homes, energy supply systems, biogas, pyrolysis, electrical panels, schemes, fuel systems, plumbing-electricity.

Log in. Our country pursues a state policy in priority areas to save all types of natural energy resources, their rational use and prevent environmental pollution. Industry consumes 35.8% of the electricity produced in Uzbekistan, 9% transport, 6% agriculture, 37.8% in the population and 11.4% in utilities, and in the future, the demand for fuel and energy resources will continue to grow.

It is known that energy is being spent a lot not only in agriculture, but also in industry, transport and other sectors. At the same time, energy demand will also increase further as the population grows. Therefore, in order to avoid a global energy shortage in the future, it is necessary to use alternative sources, including underground thermal energy, biomass energy and solar energy.

Today, in connection with the growing supply of organic fuels (oil, gas) and the aggravation of environmental protection problems, efficient use of biomass energy is relevant

At the present time, it is more convenient and economical to use pyrolysis of biogas and solar panels in houses of relatively efficient production. Manufactured houses can be available in a variety of designs and ground plans, similar to houses built on the plot.

Convection into room air. The convection flow is calculated using the heat transfer coefficients as follows: q"conv=hc(Ts-Ta) The internal convection coefficients (hc) can be calculated using one of the different models. Currently, correlation-based coefficients are used for natural, mixed, and forced convection in implementation.

Methodology. The production of biogas from animal manure, poultry waste, which is a local raw material, has been studied at a high level in developed countries. In this area, countries such as China, Italy, Japan, France, Germany, America, Russia occupy a high position. They even set out to extract biogas from plant residues. However, in these studies, the technological system of biogas production was not perfectly realized. The purity of the resulting gases is inadequate, and the development of a new, modern, combined technology for obtaining biogas from local agricultural waste and the purification of this gas from additives requires continued research.

The analysis of the scientific and technical literature of recent years, related to the research on development of energy-efficient methods of biomass energy heating, testifies to the significant theoretical and practical results in this area. The publication of numerous scientific papers devoted to the improvement of energy efficiency in heating systems of biomass energy has been published.

Published numerous monographs, collections and articles on various theoretical and practical questions in this field. In this area, Uzbek scientists Zakhidov R.A., Vardiyashvili A.B., Avezov R.A., Imamov Sh.I., Khaayriddinov B.E., Uzoqov G. Published research by N et al.

The analysis of scientific literature shows that insufficient research on the development of energy-efficient heating system based on energy of combined pyrolysis-biogas installations has not been sufficiently researched in order to save fuel and energy resources in heat supply system. Therefore, pyrolysis - the use of biogas plants in combination with energy, as well as increasing the energy efficiency thereby, has the relevant scientific and practical significance.

The Address of the President of the Republic of Uzbekistan to the Oliy Majlis and the people of Uzbekistan dated December 20, 2022, set a number of important tasks aimed at the widespread introduction of the green energy sector. In particular, important instructions were given on the construction of mini solar power plants and the installation of energy-efficient solar collectors in regions far from the country's energy sources.

Internal heat balance of a mobile home. The heart of the heat balance method is the internal heat balance, which includes the inner surfaces of room surfaces. This heat balance is typically modeled by four combined heat transfer components: 1) transmission through the building element, 2) convection into air, 3) absorption and reflection of short-wave radiation, and 4) long-wave radiation exchange. Shortwave radiation is radiation emitted from internal sources such as solar radiation and light entering the zone through windows. Long wave radiation exchanges involve the absorption and emission of all other low-temperature radiation sources such as room surfaces, equipment, and people.

The heat balance on the inner surface can be written as follows:

q"LVX+q"SV+q"LVS+q"ki+q"sol+q"conv=0 where:

q''LVX= A net long-wavelength radiation exchange flux between surfaces in a room or a group of zones (extra).

q''SV = Net short-wave radiation flux from lights.

q''LVS= A long-wave radiation flux (extra) from equipment in a room or zone group.

q''ki = Conduction flow through a wall.

q''sol = The transmitted flux of sunlight absorbed on the surface.

q''conv = Convective heat flow into room air.

Each of these heat balance components is explained briefly below.

Conclusion and discussion; Pyrolysis of proposed combined mobile homes – use for fuel from a biogas plant and availability of autonomous heating systems. Solar panels are used in electrical systems and provide high energy and cost efficiency.

Mobile homes can be useful for different groups of people and situations. Here are some examples where you may find movable homes particularly useful:

• Temporary residents: Mobile homes can be an ideal option for people in need of temporary housing, such as when building or renovating a main home or working in remote locations.

• Low-budget housing: Mobile homes can be a lot less expensive than traditional homes.

• Beekeeping using it as an innovative mobile house with affordable and all-inclusive ownership, so that people can live in fish clusters and farms

• Environmentally conscious people: Mobile homes can be built sustainably using energy-saving technologies and materials. They offer the opportunity to live a more environmentally conscious life by consuming resources and reducing pollution to the environment.

(Figure 1)Exterior and interior view of mobile home:

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Mobile house with an autonomous power supply system based on alternative energy sources.

(for beekeeping, cattle breeding, peasants and farms).

Power supply systems of mobile homes.

• Mobile homes require proper grounding and connection to protect residents from electric shocks.

• The number of panels is determined depending on the equipment and household appliances used by the consumer of electricity, for example, in mobile houses with a capacity of 2 kW 4 500 W panels are installed, which will transmit 1.8 kW of electricity to the consumer depending on the daily weather.

• In heating and fuel systems, we connect a biogas device to the system and use biomass in it, which is more convenient because of the presence of several types of biomass in agriculture.

• The depletion of the stock of organic fuels, as a result of the increase in the price of tan, gave impetus to the development of work in the renewable and alternative sectors of fuels in the following years. Due to the high energy value, biogas is used as an energy carrier not only in heat generation, but also in electricity generation. The energy power of biogas depends on the amount of methane gas it contains. The energy generated from 28 m3 of biogas is equivalent to 16.8 m3 of natural gas, 20.8 l of oil or 18.4 l of diesel fuel. The energy capacity of biogas directly depends on the amount of methane it contains. From 1 m3 of methane it is possible to produce 9.94 kilowatt-hours of electricity. Of biogas with 60% methane storage, from 1 m3 it is possible to obtain 2.2 - 3 kilowatt-hours of electricity, 4.5 - 6 kilowatt-hours of heating.



The use of pyrolysis and biogas plants has become an excellent way to heat mobile homes. They are economical and do not require much maintenance. Of course, they come with a variety of options, so you can customize your system to suit your needs. For example, you can choose the type of gas you want to use, for example, propane or butane.

1.	Solar Photovoltaic	1 NF = 2000 W
2.	Solar-Water Heating Collector	1 g = 500 l/water (500 liters of hot water per day in
		summer)
3.	Hot Water Tank Battery	1 g = 500 l/water
4.	Biogas Facility	1 V = 0.7 m3
5.	Pyrolysis Device	1 V = 1.5 m3



Appliances used in mobile homes from 1990 to 2025

CONCLUSION

The results of the study showed that assuming the average number of electricity consumers of the proposed mobile home as 4, the amount of daily demand for them is $1.5\div1.8$ kW. As a result, $30\div45$ kW will be needed for need for 1 month. Based on these results, for mobile home consumers with a volume of 40 m3 and a total surface area of 72.5 m2, it is possible to fully cover the electricity demand by installing a solar photovoltaic battery that produces $1.5\div2$ kW of electricity per hour. For the mobile home with a total volume of 40 m3, the integrated energy supply system based on biogas and solar will allow you to save up to $2.5\div2.8$ tons of conditional fuel per year.

The experiments carried out show that it is possible to pyrolyze the raw materials used for gas extraction due to biking in a biogas plant for further pyrolysis and to obtain fuel.

The electrical energy system of mobile homes is powered entirely by solar panels, provided by TV, condenser, ironing, radio, phone charging, lamps.

The heat energy spent for the individual needs of the biogas plant as a result of the utilization of heat off from the condenser in the proposed device will be fully reimbursed.

The proposed combined pyrolysis - biogas and solar panels can be used in farms, beekeeping, fish clusters and rural houses, in heating and cooling systems for use in temporary shelters, increasing energy efficiency, improving the living conditions of the consumer at low cost economically, taking into account the convenience of four seasons depending on the season

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