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THE CHALLENGES OF BIOGAS PRODUCTION IN THE CONTEXT OF POST-WAR RECOVERY

Ukraine possesses a significant biomass potential available for the production of biogas and gaseous motor biofuels. The war has dramatically changed the role and place of biogas in the national energy security system. Currently, many experts see an option to use the potential of the agricultural sector to produce alternative types of energy. The state authorities believe that the effective use of the processing industry will allow partial replacement of traditional types of energy both at the local and national levels [1].

Fuel companies and agricultural firms are carefully studying the possibilities of setting up their own plants for the integrated processing of agricultural raw materials, one of the elements of which is biogas.

Thus, biogas production in the post-war period could provide Ukraine with new opportunities, increase its gross domestic product and create additional jobs.

Biofuels offer an alternative to traditional fuels and are derived from processing environmentally friendly waste or raw materials. They can be made from various natural sources like corn, straw, and manure, and come in three main forms: gaseous, liquid, and solid. Biogas is a gas derived from biomass. Potential biogas sources encompass waste from livestock farms, wastewater, and organic materials within landfills. Biogas comprises primarily methane (60-70%), alongside CO₂ and trace gases. It serves as a versatile energy source for electricity generation, heating, and cooking purposes [2].

Biomethane, nearly pure methane, is derived either through biogas refinement or solid biomass gasification. Enriched biomethane mirrors natural gas properties, facilitating its transport and utilization equivalently. This sustains the advantages of natural gas while maintaining carbon neutrality.

Within Europe, Germany emerges as the predominant leader in the biogas industry, while significant potential is also evident in Italy, the UK, France, and Scandinavian nations like Denmark. Despite the rather intensive development of biomethane production in EU countries, this area is not developing properly in Ukraine.

Challenges of biogas production in Ukraine include: problems with connection to district heating, low efficiency of conversion into electricity, heat losses, lack of legislation on biomethane, lack of government support, underdeveloped biofuel market. biomethane-based motor fuel does not compete with the price of natural gas [2]. Although running a biogas facility can pose challenges and may not always be economically viable, there are strategies to enhance the efficiency of organic matter conversion into biogas. This involves shifting the perspective on biogas plants to view them as biochemical industrial facilities requiring effective technological oversight. With adequately trained personnel and a deep understanding of the anaerobic digestion process, these plants can thrive. Owners of biogas facilities are incentivized to optimize biogas production, aiming for the highest methane content possible to maximize its energy potential [3].

There is still no practice of consuming biomethane in transport in Ukraine, so the issue of standardizing the quality of biomethane as a car fuel is not properly regulated. The use of biomethane in compressed form during refueling at automotive gas filling stations connected to the natural gas network will mean that it is subject to the same regulatory requirements as natural gas. When biomethane is supplied to the gas network, it must comply with the requirements of the Gas Transmission System Code or the Gas Distribution System Code [4]

The recommendations of biogas production development in the post-war recovery include the following issues: development of the biomass market, ensuring non-discriminatory third-party access to heating networks, increase of the incentive tariff for heat energy from biogas, overall increase in the investment attractiveness of the bioenergy sector, solving practical problems and lack of experience in the use of agrobiomass as fuel or raw materials, development of a regulatory framework for the production and use of biogas [2, 4]. Moreover, environmental regulations and emissions control play pivotal roles in the functioning of biogas facilities, guaranteeing their eco-friendly operations. Policy frameworks are established to outline rules and principles aimed at minimizing adverse environmental impacts. These regulations encompass key areas such as air emissions, wastewater treatment, odor mitigation, and the conservation of soil and groundwater [3].

Ukraine has many competitive advantages to become a large-scale hydrogen producer for its own needs and for export to the EU. These include the presence of one of the largest gas pipeline networks, sufficient water, wind, and sun to generate hydrogen through electrolysis, and proximity to European consumers. To conclude, Ukraine, as one of the largest agricultural countries in Europe, has a great potential for generating biogas from agricultural waste and energy crops.

Literature

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