

**PROSPECTS FOR THE DEVELOPMENT OF AGRICULTURAL
PRODUCTION IN THE REPUBLIC OF UZBEKISTAN ON THE BASIS
OF THE WIDE INTRODUCTION OF ELECTROMECHANIZATION,
AUTOMATION AND NON-TRADITIONAL ENERGY SOURCES**

Ismailov Astan Ibragimovich

Andijan Machine-Building Institute, Ph.D., Associate Professor.

Email: Ismailov.astan@mail.ru

Nuriddinov Nasimjon Akhadkhonovich

Andijan Machine-Building Institute doctoral student.

Email: nuriddinovnasimxon@gmail.com

Annotation. On October 23, 2019, by Presidential Decree, the “Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030” was approved, which covered nine strategic priorities, the first of which was ensuring the food security of the population. In this regard, this article is devoted to the current state and prospects for the development of the use of electrical energy in the agricultural production of Uzbekistan based on the widespread use of alternative energy sources in technological processes and their scientific justification, which are the answer to the indicated strategy for the development of agriculture in the Republic.

Key words. electro-mechanization, electric Energy, farms, electrical supply, biogas, solar energy, technology, treatment, efficiency.

Introduction. One of the priority areas of the “Action Strategy for the Further Development of the Republic of Uzbekistan”, adopted at the beginning of 2017, is the modernization and intensive development of agriculture. On October 23, 2019, the Presidential Decree approved the "Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030",

which covered nine strategic priorities, the first of which was ensuring the food security of the population [4].

In this regard, the program of the country's economic and social development for the next 10 years also provides for a comprehensive growth in the activities of the agro-industrial complex to fully meet the growing needs of the country's population with high-quality agricultural products, as well as to improve their living standards.

During this period, the electrical energy consumed by rural consumers should grow and reach 65...70 billion kWh. Naturally, this circumstance leads to the further arming of agriculture with electrical energy, and it opens up colossal opportunities for the growth of food production.

It is known that at present there are about 300 different technical means for electro- mechanization and automation of livestock farms and poultry factories of the agro-industrial complex of the country, which create favorable conditions for electro-mechanization and automation of technological processes and the efficient use of electrical energy. As a result, only in animal husbandry, the expenditure of funds is reduced to 20 percent, and the expenditure of labor in this industry is also reduced by up to one and a half times.

It should be noted that at present, fruit drying stations, canning shops and storage facilities for agricultural products and potatoes are successfully operating in a number of farms of the republic. The operating experience of these facilities shows that the electro-mechanization of technological processes with the use of automation tools provides tangible economic benefits.

The intensive growth of the power supply of electro-mechanization of agricultural production with the widespread introduction of automation

of technological processes makes agriculture the main consumer of electrical energy. Based on this, it becomes necessary to provide continuous supply of electrical energy to agricultural consumers belonging to the first and second categories to provide for their two-way supply, as well as redundant sources and sectioning of electrical power lines [1]. To solve these problems, it is necessary to introduce the use of transformers, in which the voltage is regulated under load, and devices for automatic input of the reserve and its disconnection, as well as reconnection of lines under voltage.

It is known that on overhead lines in rural areas, short circuit cases still remain at a high level and its main causes are the following circumstances [5]:

- ◆ design shortcomings of transmission line pylons;
- ◆ insufficient current conductors with high reliability;
- ◆ ways of fastening wires between poles are imperfect;
- ◆ the operational reliability of the insulators does not meet the requirements.

However, operating experience shows the advantages and sufficient reliability of reinforced concrete poles, which requires their speedy implementation and complete replacement of the old ones in the power supply system of agricultural consumers.

Despite this, today the level of reliability of electrical supply of agricultural production facilities, mainly farms, does not meet the proper requirements, which causes a disruption in the supply of electrical energy, which negatively affects the operation of technological processes. Based on this, it can be concluded that these circumstances require the strengthening of scientific and practical work to improve power supply systems in rural areas.

Electrical energy which is based on increasing the reliability of power supply and the widespread introduction of automated technological processes, as

well as non-traditional energy sources based on biogas, solar and wind energy and mini hydropower plants [2].

Figure 1 shows the balance of energy resources in the world and Uzbekistan, which gives grounds for the need to increase the role of renewable energy sources in the country's agricultural sectors.

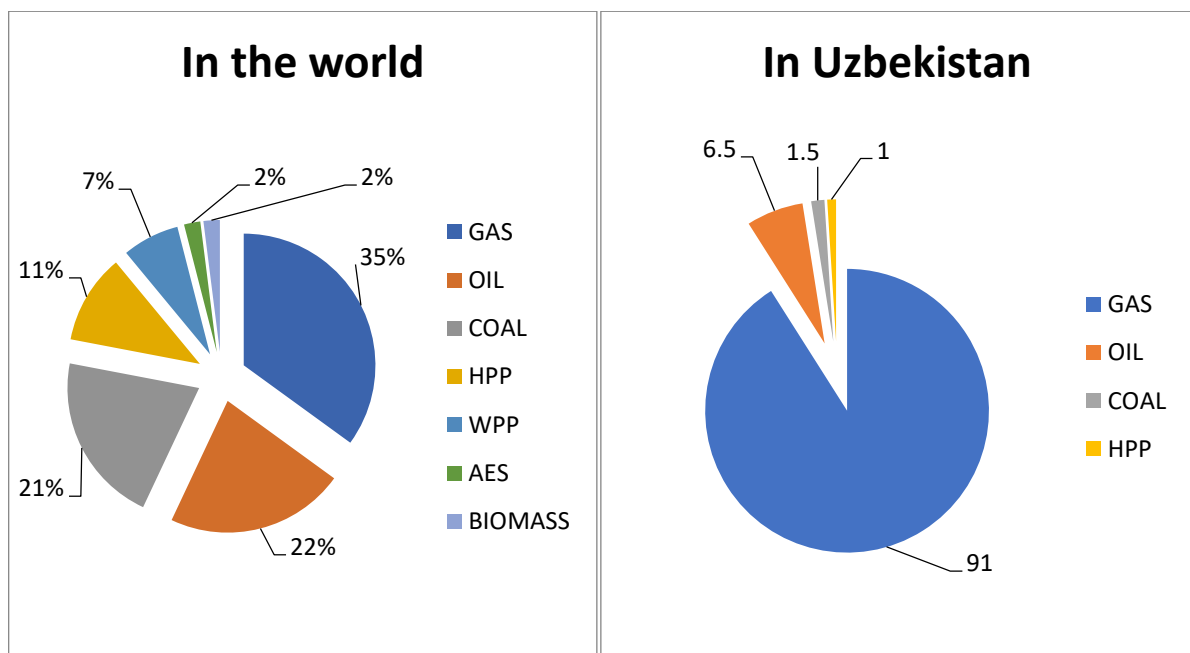


Fig.1. Balance of energy resources in the world and Uzbekistan

It is also important that the main directions of growth of the socio-economic development of the agro-industrial complex can be the comprehensive saving of consumed electrical energy and other types of material resources [3].

To solve these problems in the branches of agricultural production, it is also necessary to introduce energy-saving technologies and automation as soon as possible.

From the above opinions, we can conclude that increasing the reliability of power supply, first of all, it is necessary to improve the

quality of the design of new electrical lines and construction work and the reconstruction of old ones. As a result, we need such power supply systems, systems, backup methods and automated tools that, having prevented an emergency condition, ensured the continuity of power supply. Additional funds that will be allocated for these purposes will certainly be offset by an increase in the efficiency of agricultural production.

One of the promising areas for increasing the production of agricultural products and reducing their cost is the widespread introduction of non-traditional sources of electricity for the production of agricultural products and their processing.

Based on world practice, it is known that in the production of products and at the same time increasing their energy efficiency, the use of non-traditional sources of electricity gives positive results. Recall that recently the growth of this type of energy in the country has been given special attention at the state level [2].

On farms in countries with little energy consumers and located at a distance from each other with low production rates, the use of non-traditional energy sources gives positive efficiency and the introduction of this type in this case is considered as a requirement of today.

The trend in the development of world energy and an increase in the share of renewable energy sources in its structure shows the need for the speedy development of this type of energy in the agro-industrial complex of Uzbekistan.

Recall that today the share of dekhkan and farm enterprises is 98 percent [2]. In this regard, in order to improve the activities of farms and to fully support them, a number of resolutions of the President and the state have been adopted, and today they give their tangible effects.

It is known that in Uzbekistan of the total technical potential of renewable energy sources, the share of the sun is 98.8 percent, hydro 1.0 percent and wind 0.2 percent.

The experience gained in Uzbekistan and abroad on renewable energy technologies gives grounds that the main directions for the development of renewable energy technologies are [2]:

- ◆ Preservation of the previous state of the environment and ensuring environmental safety;
- ◆ solve social problems, improve the living conditions of the population;
- ◆ to preserve the supply of energy resources for the future generation.

Materials given in a number of sources on technologies and techniques for biogas production, systems for lifting water from wells using solar energy, technologies and technical mechanisms for solar water heating, solar hot water installations, energy-saving irrigation pumps and their definitions, the choice of manufacturers gives reason to that at present a number of farms and private entrepreneurs are engaged in the acquisition and use of these machines and mechanisms, which gives reason that renewable energy sources are widely used in the agricultural sectors of our country.

A powerful impetus for solving these problems in the agricultural sectors is provided by the decrees and decisions of the President of the Republic of March 1, 2013 “On measures for the development of non-traditional energy sources” and SMRU of November 25, 2015 No. 343 “On encouraging the construction of biogas devices on farms specializing in animal husbandry and poultry farming in the Republic.” These and

other solutions make it possible to cover 10% of the needs of energy resources in the Republic.

For example, materials within the framework of innovative projects, functioning and planned for launch in Uzbekistan, biogas complexes are given given in Table-1.

Areas	Number of objects	Reactor volume, m ³
Operating	12	760
Tashkent	3	370
Kashkadarya	3	210
Fergana	3	40
Khorezm	one	60
Samarkand	one	40
Jizzakh	one	twenty
Annual volume of gas production, m ³		554.8
Equivalent to CN ₄ production of harmful gases, tons		0.95
Objects where design work is carried out	17	8460
Tashkent	eight	6450
Samarkand	2	660
Khorezm	2	510
Jizzakh	one	480
Navoi	one	200
Namangan	one	100
Kashkadarya	one	60

Recall that in the preparation of the materials of the first table, materials from the Center for Efficient Technologies and Alternative Energy Sources were used.

Figure 1 shows the water lifting system using a photovoltaic plant installed by the Chagatai company invest and Figure 2 shows a general view of the water-lifting installation provided with energy from a solar photovoltaic

power plant carried out within the framework of the international project "Sustainable development of agriculture and climate change reduction".



Figure 2. Water-lifting plant using a photovoltaic plant installed by Chagatai invest »



Figure 3. General view of the water-lifting installation of an energy-provided solar photovoltaic plant implemented within the framework of the international project "Sustainable development of agriculture and climate change reduction".

Recall that at present, teachers of the Department of EEE of the Andijan Machine-Building Institute, in collaboration with specialists from

the National Research University (Tashkent), are conducting exploratory research work on the development and implementation of an experimental installation using renewable energy sources for processing gardens and other agricultural plants according to their protection from diseases and pests. Undoubtedly, this and other works make a tangible contribution to the introduction of renewable energy sources in agricultural production and create favorable conditions for the further development of the industry and increase the food supply of the country's population[3].

Materials devoted to the coverage of the current state and prospects for the development of electro-mechanization, automation and the use of renewable energy sources in agricultural production give reason to draw the following conclusions:

- ◆ Stable development of agricultural production should be guided by wide and comprehensive use of electrical energy in technological processes;
- ◆ power supply of agricultural production facilities should ensure reliable and uninterrupted power supply;
- ◆ when designing industrial agricultural facilities, it is necessary to focus on a high level of automation of the technological process;
- ◆ achieve widespread introduction of renewable energy sources in the power supply of machines and mechanisms of agricultural production.
- ◆ The use of renewable energy sources in the technological processes of chemical processing of orchards and plants can have a tangible effect on the quality and volume of production of fruits and vegetables.

References

1. A.N.Rasulov et al. Power supply of industrial enterprises. Textbook. 320s. Tashkent. 2019

2. A.Radjabov, N.M.Eshpulatov, M.N.Salomov, A.M.Alimov. Renewable energy technologies and their use in farms. Tashkent, 2016
3. A.Radjabov Scientific and methodological foundations for achieving energy saving in energy technological processes // AGROILM. -Tashkent,-2008. #4
4. Journal "Economic Review" No. 9 2020
5. N.Samatov, A.Ismailov, O.Nazarov. Prospects for the development of electromechanization of agricultural production. Collection of articles of the Republican scientific and technical conference "Scientific foundations for the development of standardization in agro-industrial production." Tashkent-2011.