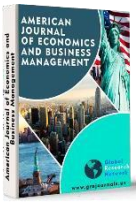

American Journal of Economics and Business Management

Vol. 8 Issue 2 | **pp.** 526-530 | **ISSN:** 2576-5973

Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

Prospects for The Development of The Electrical Engineering Industry in The Conditions of The Digital Economy

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Abstract: The article explores in detail the factors that influence the use of energy sources, economic growth and economic efficiency in the development of the electrical industry in the conditions of the digital economy in Uzbekistan. Alternative energy utilization rates have been analyzed over the last decade. In the regions, an analysis has been carried out of QTEM in energy production, energy consumption per capita and indicators of its use.

Keywords: Digital Economy, Electrical Industry, Alternative Energy, Economic Efficiency, Energy Consumption, Green Energy

1. Introduction

The digital transformation of the modern economy has a direct impact on the directions of development of industrial sectors. In particular, the electrical engineering industry has become a center of technological innovation on a global scale, becoming one of the most important factors in economic development. In the context of the digital economy, the development of this network allows not only to increase the automation and efficiency of production processes, but also to ensure the stability of economic growth through the formation of new products and services. The introduction of modern digital technologies in the electrical engineering industry makes it possible to achieve high efficiency in production processes, to widely use energy-efficient technologies and to improve the quality of products. Also, advanced technologies such as artificial intelligence, IoT (Internet of Things), large-scale data processing and blockchain are spurring further development of this network.

As a component of the economy of Uzbekistan, the electrical engineering industry is of strategic importance and serves to strengthen the national production base. Government reforms, including improvements in the investment environment, tax incentives and programs aimed at introducing innovative technologies, are serving to further expand the prospects of the electrical engineering industry. Therefore, this article will analyze the prospects for the development of the electrical engineering industry in the conditions of the digital economy, the available opportunities and the problems faced.

Review of thematic literature

O. Saidmamatov, S. Salaev, B. Eshchanov, Li Shimin, according to his scientific theory, realized that many countries are important to move to a green economy and developed specific scenarios, although the main focus is on the application of renewable

Citation: Ugli U. A. R. Prospects for The Development of The Electrical Engineering Industry in The Conditions of The Digital Economy. American Journal of Economics and Business Management 2024, 8(2), 526-530.

Received: 18th Jan 2025
Revised: 24th Jan 2025
Accepted: 31st Jan 2025
Published: 12th Feb 2025

energy technologies [1]. Given the modern economic well-being of developing countries, there is a great demand for improving the investment infrastructure in renewable energy, since developed countries have already developed a strategy of action. Practical evidence of the widespread availability of renewable energy technologies has been cited in Uzbekistan, which encourages the transition to a green economy in the country [2].

Today, the development of the electrical engineering industry is causing an increase in the volume of gross domestic product, an expansion of the range of finished products in its composition, the production of economical energy products. Parables such as E.A. Reflected in Makhmudov's research, the stages of the development of the electrical engineering industry were analyzed. The types of electrical engineering network products are classified and the level of supply of the country's economy and population is determined by these products [3].

Sh.S. Jouraev, R.B. And in Kadyrov's studies, the views on the power industry of Uzbekistan, its formation and development, its structural structure, its growth rates in the years of independence, the production of electricity in the regions and the use of non-traditional energy sources are described [4].

In order to ensure the stability of the energy system in our country, in order to build networks suitable for new capacities, install electrical storage devices, produce the necessary materials, the share of “green energy” in electricity production in Uzbekistan in 2024 is expected to reach 15 percent.

2. Materials and Methods

The research integrates both qualitative and quantitative research methodologies to analyze electrical engineering industry prospects in Uzbekistan in digital economic conditions. The methodology evaluates how energy consumption factors relate to renewable resource implementation and economic results within the industry [5]. Data Collection and Analysis: The research analyzes official statistical data regarding energy consumption, alternative energy usage and production capacity which spans throughout the past ten years. Statistical information about energy sector development patterns stems from authoritative reports and energy manufacturing documents and industrial sector industry monitoring systems. Dimension 1: Qualitative Interviews combined with expert opinion data came from policymakers along with energy producers and industry professionals. The research data demonstrates insights regarding digital technology impacts on electrical engineering industry success as well as describing market obstacles and prospective development zones [6]. Case Studies: The research examines renewable energy implementations in Uzbekistan through specific case examples of solar and wind farm establishments. The individual case studies give valuable field evidence about both implementation successes and hurdles alongside economic assessments of green power technology implementation. Comparative Analysis: Researchers conduct a comparative assessment of Uzbekistan's power industry in relation to national energy patterns particularly regarding renewables and digital instrumentation methods. The comparison process reveals leading methods used by different entities and their obstacles in addition to possibilities for knowledge sharing [7].

Economic Modeling: The assessment of renewable energy project effectiveness through economic models includes both short-term savings together with long-term advantages of green energy adoption. The evaluation models take into account multiple benefits including lower energy import expenses together with employment generation and environmental advantages and decreased emissions. Forecasting: The research uses forecasting methods to predict upcoming electrical engineering sector developments especially concerning renewable power generation capabilities combined with economic performance along with digital system advancement. The assessments use present-day industry statistics together with government programs in addition to worldwide trends

from renewable energy and digital technologies fields [8]. The analysis uses these research methods to present an extensive evaluation of how digital economy and renewable energy affect Uzbekistan's electrical engineering industry growth as well as economic performance.

3. Results

Ensuring high economic growth, ensuring sustainable development in the electrical engineering industry are today considered urgent problems. The research work carried out an analysis of energy consumption, including primary fuel per capita-enegetic resources, an analysis of the installed capacity of electricity generation in Uzbekistan. A number of factors that are considered important to improve economic efficiency have been studied and covered in detail each. In parallel, the socio-economic development of rural communities of renewable energy sources by expanding the possibilities of using cheap energy, in the Republic of Uzbekistan in 2016-2022, an analysis of electricity consumption by industry was carried out. The use of alternative energy sources has been studied and discussed in detail.

In the following drawing, we can cite a number of factors that are considered important for the use of alternative energy sources in the country, for economic growth and for increasing economic efficiency.

The availability of renewable resources as a first factor: Uzbekistan has regions with a high level of solar radiation and favorable conditions for the implementation of projects suitable for wind energy, which will serve to increase the economic efficiency of renewable energy projects.

The second factor is the diversification of the energy mix: as we have already said, energy development in Uzbekistan is carried out mainly based on the resources extracted. The large-scale use of renewable energy sources makes it possible to diversify energy sources, increase the volume of energy, reduce emissions from energy sources burned to the environment. In Uzbekistan, in order to find a solution to these parables, a number of measures are being implemented, including the implementation of the project “Organization of green hydrogen production” in Chirchiq in cooperation with the Saudi company ACWA Power, in 2025, 3,000 tons of green hydrogen and a 52 MW wind pipe are planned in the Republic, and 500,000 tons of green ammonia and 2.4 GW wind As a result of the effective use of alternative electrical energy resources, one of the first in the world is achieved to produce mineral fertilizers from green hydrogen and direct products with high added value to world markets [9].

The third factor is cost competitiveness: the cost of renewable energy technologies such as solar and wind is declining globally. In order to attract foreign investment and stimulate renewable energy projects, the Cabinet of Ministers of the Republic of Uzbekistan dated 21.09.2022 No. 518 "on accelerating the production of renewable energy devices" is envisaged to carry out investment projects with a value of $ 38.7 million by the Solar cluster for the production of solar water heating equipment and solar photovoltaic panels [10]. Increased competitiveness of renewable energy sources in terms of cost contributes to the development of green economic growth in Uzbekistan.

The fourth factor is job creation and local economic development: the development of renewable energy projects can promote job creation and local economic development [11]. This includes the production, installation, operation and maintenance of renewable energy systems. By developing the renewable energy industry, Uzbekistan can create employment opportunities and contribute to economic growth in the relevant industries.

In the development of renewable energy devices in Uzbekistan, SOLAR CLUSTER is envisaged to create 500 jobs as a result of the implementation of investment projects carried out by cluster participants [12] .

According to the "country report on climate and development" of the World Bank, the transition to a green economy in Uzbekistan does not lead to a significant reduction in jobs, but changes in the types of jobs. By 2035, the employment rate will increase by 30% in the construction, installation, use and maintenance of new green technologies, high value added services [13].

Environmental benefits in the fifth olil order: renewable energy offers environmental benefits by reducing greenhouse gas emissions and air pollution. Uzbekistan, among many other countries, is increasingly focused on the issue of environmental sustainability and climate change [14]. By switching to renewable energy sources, Uzbekistan can improve air quality, mitigate the effects of climate change, and reduce health-related costs.

The fifth factor is the use of energy and Rural Electrification: Uzbekistan has rural areas that are deprived of reliable electricity. Renewable energy technologies such as off-grid solar systems or mini-networks can provide cost-effective solutions for rural electrification. By expanding access to clean and affordable energy, renewable energy sources can contribute to the socio-economic development of rural communities.

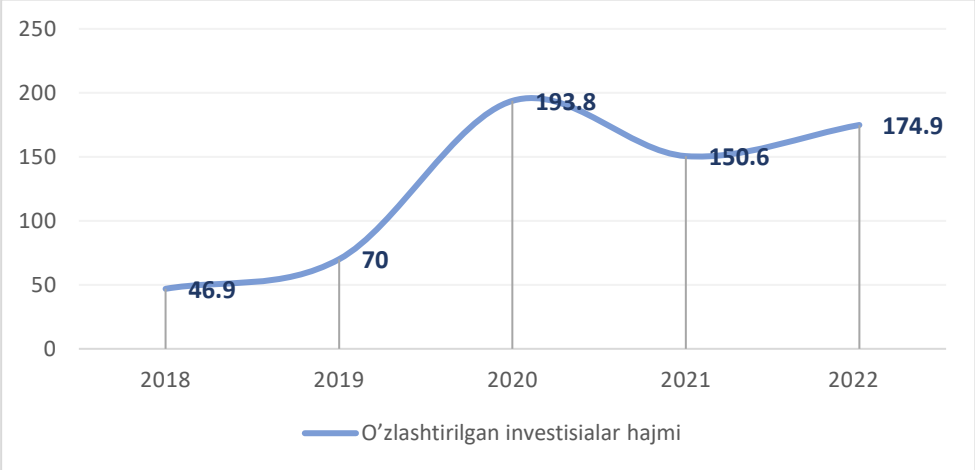

Figure 1. Volume and indicators of investments mastered in the field of Electrical Engineering(mln dollars).

The volume of industry-oriented investments is increasing every year. The volume of investments attracted in 2017 amounted to 82 million. dollars, 174.9 million in 2022. the dollar was.

4. Discussion

In order to provide energy to the population and economy of our country, a number of works are being carried out by the government. Including, at the end of 2022, 5 solar and 1 wind farm were commissioned by the president of the country. The full launch of these projects, valued at $ 2 billion, will enable more than two million households to provide uninterrupted electricity, save 2 billion cubic meters of natural gas, and create a value added of $ 4 billion in industry and services. Alternative energy sources are planned to reach 27 gigawatts by 2030. This will allow the economy of 25 billion cubic meters of natural gas every year, reducing harmful emissions into the atmosphere by 34 million tons [15].

5. Conclusion

The international market of the electrical engineering industry is one of the most dynamically developing segments of the international economy. Its volume in the world is estimated at almost 1.2 trillion dollars. According to international studies, the production of industrial goods and services of high added value has developed in countries with a favorable geographical location and a leader in the cost of R & D in relation

to gross domestic product. In Uzbekistan, too, great attention is paid to the development of this sphere, and its participants are setting ambitious plans for themselves.

The importance and prospects of the electrical engineering industry for the country's economy can be noted once again. The faster the production capacity is increased and the quality of the product being produced increases, the more opportunities open up to realize the export potential, which will allow you to compete with more famous World brands in the future and fully meet the demand in the domestic market. In addition, the unemployment rate can be lowered by creating yagi jobs.

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