



## International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

---

### DIDACTIC CONDITIONS OF USING DIGITAL TECHNOLOGIES IN TRAINING FUTURE ENGINEERS

Akhmedov Juraboy

Professor of Jizzakh Polytechnic Institute

Uktamov Davronjon

Independent researcher at Jizzakh Polytechnic Institute

#### Abstract

This article discusses the state of use of renewable energy sources in the Republic of Uzbekistan, current issues in ensuring sustainable development in the energy sector, and the problems of improving the system of personnel training in engineering. The authors analyze the didactic conditions for the use of digital technologies in the process of energy education and justify the need to strengthen the integration of education and production. Also, ways to develop the practical skills of future engineers through the introduction of innovative teaching methods in the higher education system, increasing the professional competence of teachers, and forming a digital learning environment are indicated. The article is aimed at increasing the efficiency of education and training qualified specialists in the competitive energy sector of Uzbekistan through the introduction of digital technologies.

**Keywords:** Digital technologies, engineering education, renewable energy, energy efficiency, innovative education, didactic conditions, information and communication technologies, advanced training, higher education, digital pedagogy.



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

The years of independence are literally associated with the implementation of large-scale reforms aimed at determining the prospects for the socio-economic and cultural development of the Republic of Uzbekistan, striving to take a worthy place among the countries of the world community, and the implementation of fundamental reforms in all spheres of social life, taking into account the experience of developed countries of the world, local conditions, economic and intellectual resources, is ensuring the achievement of new achievements. Although international cooperation in various fields is bearing fruit, strengthening our independent state in all respects, enriching the achievements, and promptly eliminating existing shortcomings requires special dedication, dedication, enthusiasm and determination from members of society [1]. Energy occupies an important place in the life of a person and society, it allows satisfying various needs of people and improving living conditions. The development of human civilization has always been closely related to the volume and types of energy used. The power of any country in social life also depends on its energy supply. The reason for the global ecological catastrophe that is unfolding before the eyes of the current generation is that during the 20th century, the amount of energy used by humanity for economic development has increased significantly. This has a negative impact on the environment. Because global warming of the climate on a global scale, the operation of thermal power plants using organic types of fuel, is directly related to the gases emitted into the atmosphere by internal combustion engines, which are increasingly being used. In the last 40 years, more organic fuels have been extracted than in the entire history of mankind. The current century is no exception. Today, global fuel consumption is over 12 billion tons of oil equivalent per year, and the demand for organic fuels is growing rapidly [2].



**International Congress on Economics, Management and Business Studies**

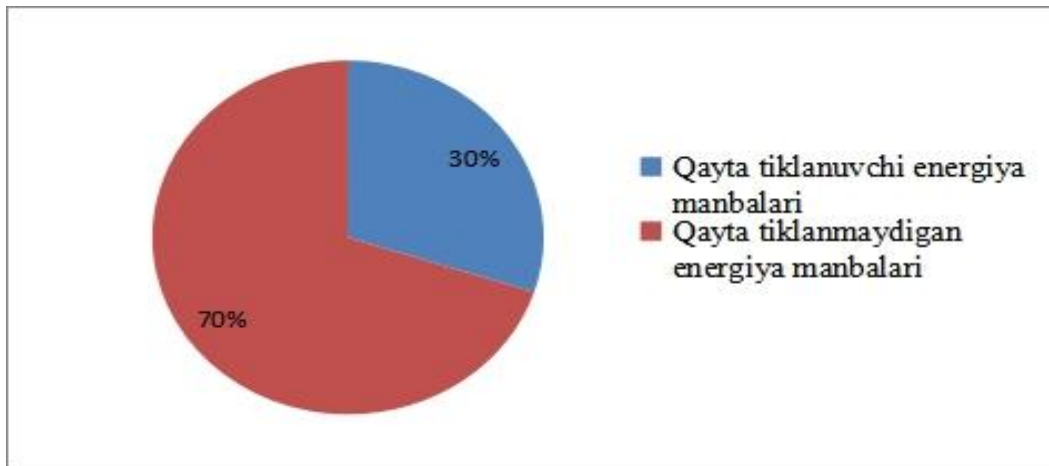
Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

The established traditional methods of electricity supply and the current rapid development of the economy, as well as the negative impact of population growth on the environment, continue, it is inevitable that the consumption of energy resources will increase accordingly. Clean energy technologies have not yet been able to significantly affect the solution to this problem .

Hydropower potential of rivers, reservoirs and canals, solar and wind energy, biomass, household waste, tides and ocean waves, and geothermal energy are all examples of alternative energy sources. Theoretically, renewable energy sources offer great opportunities for their widespread use , and providing humanity with energy in the future and protecting it from environmental catastrophe can only be achieved through the use of non-traditional renewable energy sources [3].



**Figure 1.1. Global energy resource use**

28.1 % of the world's electricity generation comes from alternative energy sources and is divided into:

The installed capacity of wind turbines in the world is approximately 3600 MW. The installed capacity of hydropower plants in the world is approximately 670 TW.



**International Congress on Economics, Management and Business Studies**

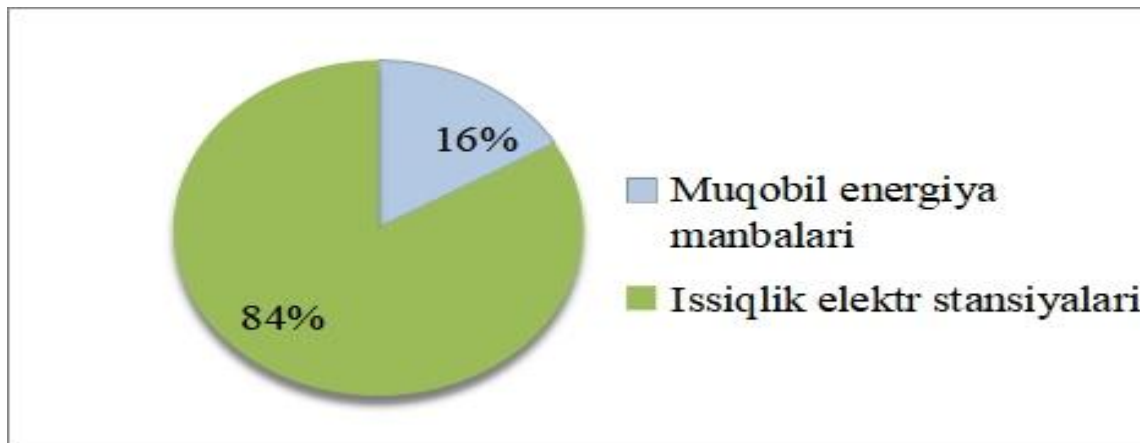
Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

The installed capacity of solar installations in the world is approximately 800 GW.

The installed capacity of geothermal installations in the world is approximately 9,000 MW.



**Figure 1.2. State of energy resource use in the Republic of Uzbekistan.**

16% of the electricity generated in our country comes from alternative energy sources and is divided into the following:

The installed capacity of hydropower plants is 1444.7 MW .

The installed capacity of solar installations is 200 MW.

In accordance with the comprehensive program for further improving the energy efficiency of economic sectors and the social sphere, introducing energy-saving technologies, and developing renewable energy sources in the Republic of Uzbekistan in 2019-2022, the following are being implemented:

renewable energy sources, increase their consumption share to 25 percent of total electricity production by 2030;

uninterrupted supply of energy resources to organizations' facilities in the regions ;



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

---

installation of solar photovoltaic plants (average 2 kW) and solar water heaters (average 200 liters) in private homes;

It is planned to replace non-standard gas-burning appliances of household consumers, as well as legal entities, with modern and energy-efficient gas-burning appliances [4].

It is envisaged that the economy will be provided with energy resources by solving two tasks. Firstly, diversifying the fuel balance through the widespread use of renewable energy resources. This involves replacing traditional fuels with renewable energy sources to reduce their share in electricity and heat generation. Secondly, this will be achieved by implementing a long-term program to reduce the energy intensity of production in sectors of the economy, improving the environmental condition of industrial areas.

In the near future, the priority tasks are to reduce the energy and resource intensity of the economy, widely introduce energy-saving technologies into production, expand the use of renewable energy sources, and increase labor efficiency.

The reason why world science is currently paying special attention to finding, creating, and increasing the efficiency of using renewable energy sources, as well as conducting propaganda and advocacy work in this regard, is that if we do not gradually switch to the use of renewable energy, the world's population will face a huge problem as a result of the depletion of our natural resources, namely oil and gas reserves.

Uzbekistan has a large potential for renewable energy sources, estimated at approximately 51.0 billion tons. The availability of significant potential for all renewable energy sources is an important basis for the successful development of renewable energy. The creation of a favorable economic environment in Uzbekistan will allow for the development of a significant part of this technical potential.



## International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

**Table 1.1 Renewable energy potential in Uzbekistan**

Authority	Total (mln.tne)	Including energy (mln.tne)			
		Hydro	Sun	Wind	Geothermal
Gross	50984.6	9.2	50973.0	2.2	0.2
Technical	179.0	1.8	176.8	0.4	-
Mastered	0.6	0.6	-	-	-

Same at the time In Uzbekistan again renewable all energy from sources rivers energy potential successful In addition , in recent years , although wind and solar energy are exemplary, a number of projects have been implemented to use them. At the same time, there are opportunities and incentives for the wider use of the following renewable energy technologies in the republic:

- solar panels for water heating;
- solar photovoltaic systems for electricity generation;
- microhydroelectric power plants for electricity generation;
- wind generators for electricity generation;
- biogas plants for electricity and heat production.

In the future, the possibility of using other technologies should also be considered , namely:

- large waste incineration facilities, for example, the use of household waste in the centralized heating system in large cities such as Tashkent or Samarkand;
- use of solar power plants;
- use of geothermal energy.

The increasing technical complexity of the means of production in the world places great demands on the professional intellectual qualities of engineers and their creative abilities. The success of students in their future professional activities is largely determined by the quality of the educational process at the stage of professional training in higher education institutions [5].



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

---

The following factors prevent students in higher education institutions from becoming excellent specialists in their field:

The fact that the science developed from specialized disciplines in the higher education system lags behind innovations in the production of programs.

Many technical higher education institutions lack practical and laboratory equipment.

higher education institutions and manufacturing enterprises.

of developing specialists who are fully proficient in their profession in each educational field has always been a primary task of the educational process. The fact that specialists in the energy system are not prepared for large-scale accidents (blackouts) indicates that they do not have sufficient skills [6].

is a term derived from English and refers to a complete loss of electricity supply. As a rule, this term is used only for events where the power outage affects a large area of residential areas and the power supply is not restored for a period of from one hour to several weeks. It should be noted that this term has several meanings and areas of application.

Power outages have occurred throughout history in developed countries, including the largest power outage in the United States on August 14, 2003, when 50 million people were left without power and economic losses were estimated at around \$10 billion.

In 2006, power outages in many Western European countries affected the daily lives of nearly 10 million people.

In 2011, widespread power outages in Brazil caused an economic loss of \$60 million.

It is planned to create a single ring system in our country by building 500-750 kilovolt networks. In particular, by 2026, it is planned to increase the total generation capacity to 27,400 megawatts and the annual production volume to



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

110 billion kilowatt hours. Then, all regions of our country will be firmly connected through 500-750 kilovolt networks and a single system will be created. The guarantee that such situations will not be repeated is to provide qualified specialists with quality education and the formation of sufficient knowledge and skills. To do this, first of all, improve the programs of educational programs in the energy sector by optimizing the content and introducing modern electrical equipment. It would be appropriate to conduct specialized subjects using interactive methods and special technical means.

The goal of modernizing education is to ensure that educational development reflects the social and economic needs of society, the needs of each individual and family. To create such a development system, the following tasks must be implemented:

- ensuring the right to full education by the state ;
- ensuring the quality of modern education at all stages of the education system;
- improving the legal and regulatory framework of education and identifying and attracting new resources for organizational and economic mechanisms;
- development and promotion of professional and innovative competence of teaching staff;
- wide introduction of the latest achievements of information and communication technologies into the education system;
- implementation of innovative educational technologies aimed at developing a consortium between science , education and production [7].

In the retraining and advanced training courses of teachers of higher educational institutions, it is important to familiarize them with innovative educational technologies , new, innovative forms, methods and means of teaching, to familiarize them with the essence of professional competence and creative abilities of teachers, to increase the intellectual potential of teachers of various



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

---

specialties, to enrich their worldview. The fact that the training module is being taught in the advanced training system not only creates conditions for teachers to become aware of the organizational, technical and didactic capabilities of modern innovative educational technologies, to use innovative teaching technologies in educational practice, to form skills for the consistent development of competence qualities and creative abilities, but also ensures the strengthening of their skills in their effective use in professional activities.

### **REFERENCES**

1. Uktamov D.O. Regulatory and legal framework for the use of digital technologies in the educational process. Collection of materials of the "International Scientific and Technical" conference on computer science and engineering technologies No. 2 October 13, 2023, 339-342.
2. Uktamov D.O. The role and importance of digital technologies in preparing future engineers for professional activity . Scientific Methodological Journal 2024 No. 2/2 131-136.
3. Uktamov D.O. Methodological system for using digital technologies in training future engineers. Professional education in Uzbekistan 2024 No. 1, 52-58.
4. Akhmedov J.R, Nurov U.X, Uktamov D.O. Technological map of the methodology for preparing engineering and pedagogues for innovative activities in an informational educational environment . International scientific and practical online conference "Computer linguistics: problems and solutions" . - Tashkent. 19.04.2021. Pages 29-36.
5. Uktamov D.O. Digital educational technologies as a means of preparing future engineers for professional activity. Innovative technologies in the



## **International Congress on Economics, Management and Business Studies**

Hosted Online from New York, USA

Date: 23<sup>rd</sup> January, 2026

Website: <https://econferencia.com>

- 
- environment of digitalization of higher education: Problems and solutions  
International scientific and practical conference March 14-15, 2024 105-109.
6. Hamidov J.A, Murodova A.Y. (2023) Technology for development of professional and technical component of future engineers through virtual educational technology Atamuratov RK The educational advantages of virtual reality technologies. The Competing Science and Technology International Journal, 4 May 2023, pp. 87-90.
  7. Murodova A.Y. (2023) Virtualization in the training of engineers as a factor of increasing scientific efficiency. Academic Research Journal 2023. Pages 184-189.