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Methods of teaching the issues of energy supply in agriculture and water economy (national and foreign experience)

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Abstract

In the following article the contemporary methodics of teaching the issues of energy supplies in the agriculture and irrigation. The new innovational technologies of supply of energy are discussed. The electrical grid of Uzbekistan is expanding based on the state run and internationally funded development support programs.

Keywords*:* the innovational technologies of teaching the syllabus of energetic, supply of electric energy, "Smart water" technologies, water sector, project "Modernization of agricultural sector", Vestas Wind Systems A/S, Siemens Gamensa Renewable Energy A/S, usage of electric energy in pumping stations.

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I. Introduction

Drop irrigation is already is integral part of Uzbek sector of agriculture which requires large amounts of guaranteed electric energy supply.In the end of 2020 there were already 5 percent of the Uzbekistan's totalland plots irrigated by drop irrigation. As it is stipulated by the high-level orders in the short run the Uzbekistan aims to introduce drop irrigation& watering technologies in 430 thousand hectares of land plots in the near future. It is over 3 billion. cubic metres is a water saving target. Here the contribution of the World Bank is evident. This project is primarily aimed at ensuring rational use of electricity resources in the sector of the maintenance of pumping stations.According to the data supplied by well reputed organization International Energy Agency(IEA), by 2030, more than 30% of the world's energy balance will be provided with energy resources which are renewable. In achieving this goal, investments in the industry amounted to at least USD400 billion [1].

On 11 December, 2020, the President of Uzbekistan adopted a resolution "On measures for more intensively organization of the introduction of water-saving technologies in the agriculture". In this resolution plans and programs were defined for each region, district on the tasks set out in this meeting and decisions[2].

II. Methods

Case study and statisticalmethods show the influence of the changes in electric energy production. When transferring the methodology of teaching energy supply issues in agriculture and water economy, as well as national and foreign experience based on modern pedagogical technologies, it is necessary to rely on the following legal and regulatory documents:

Based on the decree of the President of the Republic of Uzbekistan № PF-5330 dated from 12 February, 2018 "On organizational tasks for drasticchange of the state management system of Agriculture and Water Resources", the Ministry of Agriculture and the Ministry of Water Resources was established based on the of the Ministry of Agriculture and water resources of the Republic of Uzbekistan. According to the decree of the President of the Republic of Uzbekistan №PP-3672 dated from17 April, 2018 "On the establishment of activities of Ministry of Water resources of the Republic of Uzbekistan", the limited number of management personnel of the institutional structure of the Ministry of Water Resources of Uzbekistan, the Ministry of Water resources of Karakalpakstan were organized.

Accordingto the decision № 500 of the Cabinet of Ministers "On approval of legal normative documents regulating the activities of the Ministry of Water resourcesof the Republic of Uzbekistan" dated from 3 July, 2018, the regulation on the Ministry of Water resources of the Republic of Uzbekistan was approved, the main activities and tasks of the ministry were determined. According to the decree of the president of the Republic of Uzbekistan № PP-4486 dated from 9 October, 2019 "On measures for further improvement of the Water Resource Management System", the implementation of irrigation and land reclamation projects, the implementation of market principles and principles in the field of Water Management, the implementation of priority tasks in this field in the field of development were substantiated.

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Until 2030 out of datedequpment in 2100 pumps will be replaced to a new ones; online monitoring system of electricity consumption will be introduced in 1687 pumping units; existing units in 1750 pumping units will be replaced to energy-saving units of pumping.

In order to avert the corruption occurencesin the system of water treatment, a sceme of estimates for the extensive introduction of digital methodics was approved, the following issues were set in this regard: -in combination with the introduction of an automated water management system in the accounting of water consumption, it is necessary to preserve an accurate estimation of water resources and to ensure that cases of hiding the exact amount of resources water received are not allowed; -guarantee the supply of water on the basis of the application without formalizing the contract in the water demand-suppy relationship by water management staff; -evolution of an interservices' unified data system for the evolution of mark lists and cooperativeness with applicable ministries; -development of a translucent framework for the formation of a list of melioration and irrigation facilities included in the address list of Project-Search works; -in order to assess the situation of land reclamation in irrigated lands, it is necessary to carry out capital renovations of observation wells and to mechanically detect the volume, temperature and saltiness of drained water with high-precisionin real-time frame; - initiation of a unique electronic system for commanding the estimation of electrical energy spent on pumps and renovation works; - improvement of issues of recruitment, appointment and release in the system of the ministry; - organization of monitoring of the work of the system organizations through online remote control *GPS*(US), *GLONASS*, *Galileo*(EU), *BeiDou*devices for the purpose of effective, rational use of machines and vehicles in the account; implementation of online electronic monitoring by the Ministry of finances' cash flow actions carried out in the management of budgetary funds in the network organizations (wages, equated payments, goods and tangible wealth, work, utilities, etc.), and etc.

- Based on the financial support of the Swiss Agency for Development and Cooperation, a computer software had been developed to streghten the water use plan and the procedure for its calculation from scratch
- New 533 pumping stations will be upgraded step by step. After the modernization process is completed, the average annual turnover saving will be 300 million US dollarsin addition to the fact that saving of electricity, more than watering of 900 thousand hectares of land is guaranteed.
- On average, 4-5 million kWh of electrical energy is saved a year on the basis of the installation of energy-saving technologies on pumps on electricity.
- 219 units of electroengine in 2021-2022, 573 units in 2020 and 2100 units in 2030 will be replaced. Consequently, 7,897 million kWh in 2020 has raised 18,036 million kWh in 2021-2022, total 25,933 million kWh is expected to be be saved.
- In 2020 163 pumps were replaced, 344 units in 2021-2022, and 1750 units until 2030 will be replaced. As a result of this, in 2020, 5,442 million kWh were saved, in 2021-2022 million 10,933 million kWh, total 16,375 million kWh are defined to be saved.

On November 25, 2019, Ministry of Water resources of Uzbekistanand "Sustainable Energy Services International" company of New Zealand signed a memorandum of understanding on the introduction of public-private partnership on pumping stations. This memorandum sets out

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the tasks related to the management of pumps in the water management system on the terms of Public-Private Partnership. It is planned to introduce public-private partnership relations in 50 water treatment facilities in 22 sub-unites of the Republic and approved the list of 25 pumping stations under the terms of Public-Private Partnership.

In mediathe total number of members of other groups launched for the purpose of coverage of water activities in the social network exceeded 7 thousand people. Already more people are using the *https://t.me/TGminwater, https://t.me/tomchiguruhi* append other social media outlets.

In the sector of cultivation of products of agriculture from year 2021, subsidies are given by state to the agricultural producers to cover part of the costs for the introduction of water-saving technologies. According to the decision, the Ministry of water resources will launch until December 1, 2021, a single electronic information system on the Republic, which accounts for the consumption of electricity and the volume of water produced in 1688 pumps. Beginninf from academic year 2021/2022 in professional educational institutions, a system of training, retraining and professional development on the introduction and use of technologies which savewater will be introduced [3].

In accordance with the decree of the President of the Republic of Uzbekistan dated from 17 June 2019 PF-5472 “On measures for effective use of land and water resources in agriculture”, increasing the efficiency of the use of electricity in the pumps of the system of the Ministry of water resources, Ministry of Information technologies and communications, Ministry of Innovational develomentexpanding the scope of the introduction of the electronic system “Smart water” in interested ministries and departments are identified as responsible[4].

The suggested project “Modernization of Agriculture” reinforces the strategy of the Government of Uzbekistan to reform agriculture in order to successfully transfromation to a market-oriented and inclusive agricultural sector.

Reforms in agriculture are an important part of the package of reforms established along the two main lines necessary for this transition: (i) to expand the participation of markets and the private sector in the economy; (ii) to reinforceamalgamation. In the proposed project within the framework of the country’s cooperation, which was revised for 2016-2020, the World Bank Group takes part in the energy sector of Uzbekistan and plays an important role. Thisestimate is in line with the development strategy of the Government of Uzbekistan for 2017-2021. The main priority directions of economic reforms in the development strategy are aimed at inclusive economic growth, achieving a high and stable pace of job creation, improving the quality and efficiency of public services.

With the beginning of the 21st century, in economically developed countries “generalization” in internal combustion engines with the help of thermal electricity and organic fuels and the negative impact on energy consumption, on the environment, led to an increase in emissions. The global upwards trends in temperature in the Earth’s atmosphere has led to the emission of heat electricity, as well as combustion products of vehicles operating on organic fuels.

The amount of organic fuel that burns every year in the world today is equal to 12 billion tons of oil equivalent or 2 tons of oil equivalent for every person on our planet. Over the last 60 years, the total amount of organic fuels manufactured in the Globe has increased beyond the

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quantity produced in the history of mankind, which results in a reduction ofstocks.

Recently, the upward trend in the prices of raw materials of hydrocarbon in many countries has forced people to think about alternative types of energy sources, as a result of which the total power in photovoltaic plants installed in European countries, the production of these Canes in the countries of the Middle East has doubled. In the US, the total area of solar collars is 15 million square metersto m^2, in Japan 12 millionm^2, in Israel reached about 1 million m^2. The use of wind energy is developing in European countries with an annual growth of 40-45%. The experience of using renewable energy devices shows that, despite the high cost of purchasing and using them in the initial period, they quickly cover the costs incurred. The Danish company *Vestas Wind Systems A/S* is currently the largest manufacturer of alternative energy systems. The next places are occupied by *Siemens Gamensa Renewable Energy A/S.*

The economy of Uzbekistan consumes a lot of energy according to international standards. In 2009, the GDP index for the energy consumption unit of Uzbekistan (in 2005 in US dollars per 1 kg of oil equivalent) was equal to 2.7 US dollars per 1.5 kg of oil equivalent. For comparison, in the same year, the indicator of Russia was equal to -3, Turkmenistan -1.7, USA -5.9, Switzerland -10.6, Singapore -12.5, Indonesia -4.3.

Here the account the technological outdated equipment, the high share of energy resources in the production of goods, the country's exports, relatively low prices for certain types of electricity-fuel, a sufficient system of accounting for the production and consumption of electricity resources. The efficiency of equipment used in many electrical installations of Uzbekistan is lower than international standards. The useful working coefficient of equipment used in many electrical circuits is low by international standards. At the same time, as a result of wear on the plug of the equipment, its efficiency decreases. Due to the limited financial resources, "Uzbekenergo" was not able to allocate sufficient funds for the provision of necessary technical services, reconstruction, replacement and expansion of the energy sector.

Uzbekistan inherited such an economy as the CIS countries, which has old technologies in the production of energy in agriculture. In the transition from administrative command to market economy, the optimal combination of planning with environmental policy is the priority in its energy policy.

With so much going on, and with so many suppliers andenergy tariffsto choose from, this is where this guide comes in to help you learn about the different energy companies on offer when it comes to comparing energy prices.As an energy comparison service helping consumersswitch energysuppliers, we feel it is our duty to not only make energy savings but also to help consumers learn more about their energy supplier including:

- Who they are?
- How they are financed?
- Whether they provide good customer service?
- How competitive their pricingis?
- How they generate their energy?
- Do they generate green energy?
- Do they offer Smart Meters?

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By 2030, the average annual temperature increase reaches 2-3 degrees in the northern zone and 1 degree in the southern zone of the state. Climate change leads to an increase in water losses by 10-15% due to evaporation from the surface of the water and by 10-20% as a result of precipitation by plants, which leads to an increase in water consumption by an average of 18%, which is not returned by the suitability of the water intake. Over the last 50-55 years, the level of the Aral Sea decreased by more than 22,0 m, the area of water ombor decreased by more than 3.8 times, the volume of water decreased from 1064 to 115 km^3, the salinity of water reached 72 g/l. The area of the drained tub is 4,2 million square meters. made up a square meter. The length of the dust storms reached 400 km and the width 40 km, while the dust stroms reached 300 km.

The international program of the energy saving alliance is intended to promote energy saving in the world, the program is also implemented on five continents. The international program applies to more than 25 countries. The program includes six areas of activity, the program for effective water supply in the development of sustainable agriculture, cooperation of companies engaged in educational and dissemination of Information, development, non-governmental organizations, energy conservation.

The alliance's programs, such as the initiative for sustainable development of cities and the effective water supply of cities, serve as a context for this document, the Urban Water Efficiency Program is aimed at building capacity at the urban level and establishing much-needed links between representatives of the public, private and non-governmental sectors. These networks are attracted by stimulating energy efficiency.

From 2 to 3 percent of the energy consumed by the world is used to supply and purify water to meet the needs of urban residents and industries. 1 the energy consumption of most water management systems around the world can be reduced by at least 25 percent by implementing cost-effective measures to improve the efficiency of such systems. To date, the reduction in energy consumption in urban water management systems has been given relatively little attention [5].

Measures aimed at eliminating the above problems may include redevelopment, system reassembly and equipment upgrades:

- Reducing the volume of pumps, changing the working shape;
- Reduction the leakage and modernization of equipment;
- Installation of pipes with low friction;
- Installation of pumps with fixture high resistance;
- Installation of electric motors with variable speed;
- Installing capacitors;
- Installing transformers;
- Improving and using techniques of maintenance;
- To clean and re-use water to soak.

In the world, a large amount of energy is used in agriculture for water supply needs**.** The amount of energy consumed by water supply systems in the world - more than 26 quadrillion (1 quadrillion) - is equal to the total amount of energy consumed by Japan and Taiwan and is 7 percent of the world’s total energy consumption. In the US, the water and wastewater treatment sector consumes 75 billion kWh of electricity a year, which is about 3 percent of total electricity, about

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6 percent of electricity in the pulp and paper and oil industries.

- Less than 1 percent of the world's fresh water resources – about 0.008 percent of the world's total water resources are accessible for immediate use.
- Due to the increase in the world population, the average annual volume of renewable world water per capita in the 2000 year was 7,045 m^3, decreasing by 40 percent compared to the 1970 year.
- The country (most of which is located in Africa and the Middle East) suffers from chronic water scarcity, which complicates the solution of food problems and undermines its economic development.
- Transportation over long distances, as well as expelling it from deep underground layers, requires more energy consumption.

"Effective use of energy in agricultural systems" refers to a wide range of measures for the effective use of water and energy, the synergy that arises as a result of the integrated management of water and energy resources. Understanding the relationship between water and energy in water supply systems, considering the issues of water-energy consumption separately, provides a wide range of opportunities for the application of their methods in increasing the efficiency of these systems.

According to a recent study in the state of Texas, the total electricity consumption in water and agricultural services in the United States decreased by 15 percent to about 1 billion. it can save dollars. Energy efficiency achieved through the efficient use of water plays an important role in ensuring the required level of energy supply for the municipal farm. Many agricultural enterprises in the world have faced the problem of energy scarcity. Considering the consumption of large amounts of energy in water supply systems, the rapid energy shortage in agriculture can help reduce the potential and reduce the need for expensive new energy infrastructure by implementing energy efficiency measures in water management systems.

In 2001, due to a decrease in the amount of precipitation in the Central and northern parts of Brazil, there was a crisis in the supply of electricity due to the restriction of the production of electricity from hydroelectric power stations. The city of Fortaleza, located in North Eastern Seara state, was at risk of a full power failure due to a 20 percent electricity shortage generated.

Scope of potential opportunities: in the case of the US state of Texas, which determines moderate targets in setting energy efficiency goals, the state of Texas will not be able to improve the current water situation, but at least 1.6 billion US dollars a year and it is planned to save 200 million cubic metres of natural gas.

In order to meet the growing demand for Water Resources, the state government has actively approached the issue of efficiency of water. At the same time, public utilities of the state have large reserves for saving water resources and reducing energy consumption. It is supplied with 3.0 billion gallons of water to meet urban and industrial needs. Total electricity consumption in water supply systems amounted to 2.8-4.8 billion cubic meters per year. Water authorities annually charge 180-288 million USD for electricity will be spent. The amount of electricity required in the production of chemical reagents for the purification of chlorinated water is equal to 1,000-0,005 kWh. of water (0,028 kWh per 1,000 liters), which is spent on the pump 0.02-0,10

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kWh. Potential water and energy savings in the water supply sector the amount of water supplied to reduce water losses in Texas water systems by 5 percent is approximately 9-14 million US dollars 140-240 million kWh annually.

An additional 10% increase in energy efficiency in water supply systems is expected to increase the amount of additional saves 300 million kWh of electricity. A Texas-based and supported household water consumption survey found an opportunity to reduce household hot water consumption by 10-20 percent. This opens up thanks to the implementation of programs that promote the use of energy-efficient equipment.

Thanks to the introduction of such technologies, Texas has raised USD 1 billion kWh of electricity annually, 7 billion cubic meters of natural gas and saves US 21 million dollars of natural gas.. Industrial water pollution currently accounts for 2.8 billion gallons per day in the industrial sector. Gallon (10.6 billion gallons) consume, to pump and clean 1,000 gallon of used water every 0.5-2.0 kWh of electricity (0.13-0.53 kWh per 1,000 liters). Reducing these costs by at least 10 percent is equal to 100 million kW hoursof saved electricity. Human resources needed for energy efficiency Group in water management systems. In the course of the lesson, the following principles are relied on when teaching *Smart Water* Technologies.

Figure 1.

Members of the group with potential	List of duties
Managing board	ıpport in local government areas and other municipal government areas ▪ Solution of important issues; ▪ Ensuring the financing of the project; ▪ Securing the group's budget; ▪ Control of fulfilment
Managing the efficiency of energy use in water systems	▪ Motivation of group members; ▪ Create a worldview and set goals; ▪ Plan and develop a work schedule; ▪ Distribution tasks; ▪ Coordination of information flows; ▪ Assessment of potential opportunities on the scale of farmer farm; ▪ Support for project financing; ▪ Facilitating cooperation between departments
Energy sector personnel	▪ To present the basic volume of data; ▪ Participation in the identification and implementation of projects; ▪ Serves as a source of choice for new technologies

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Economist of water supply and sewerage services	Providing information on long-term investments in the process of increasing energy efficiency in water management systems
Grid in common use	▪ Review and present performance improvement tools ▪ Source of financing the potential

Outsourcing. The program for increasing energy efficiency in water management systems has been developed, there may be necessary resources, skills to carry out the activities of the energy efficiency Group in the municipal water supply and sewerage system, effective personnel and water management systems. Attracting foreign resources and companies specializing in the necessary areas of activity is often a cost-effective method that allows the agency of water resources to actively implement measures to reduce water and energy consumption.

Group tools and resources on energy efficiency in water management systems. In the process of organizing a performance group and planning its activities, managers will need to identify and provide the many resources needed for the success of the group. Below are the most common resources.

Ensuring the performance of pedagogical innovations is an important part of institutionalization in any bureaucratic structure. The budget for the city water and sewerage efficiency Group is an important factor in obtaining appropriate funds and skills, organizing Technical Research, carrying out relevant projects and ensuring the continuity and integrity of the process.

Time. Team members must have the necessary time resource to focus their efforts on productive issues. In Indore, India, the group's key experts reiterated that their workloads often did not allow them to focus fully on activities in the area of water and efficiency of energy.

Access to key personnel (leading specialists). In preparation for giving full authority to the group on energy efficiency in the systems ofwater management, regulation must ensure that key professionals can access and engage both within and outside the group.

Upbringing. Appropriate training will give the members of the group the necessary knowledge to achieve their goals. During the training, members of the team have the opportunity to learn new technologies in the field of water and energy efficiency, modern methods of performance and service delivery, and managers can learn how to best manage their employees in order to achieve their goals of increasing efficiency.

Control and measuring equipment. One of the first tasks of the group is to evaluate the existing system of control and measuring equipment in order to update it and identify additional equipment needs (flow meters, Pressure meters, etc.). The quality and quantity of measurement data can always be improved by increasing the power and accuracy of the control and measurement system. This is reflected in Figure 2.

Criteria for measuring technical parameters of energy efficiency in water management systems.

Figure 2

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Parameters	Typical equipment of measurements
Water expenditure It allows to determine the high resistance and Real-time water supply requirements within the pipes, comparing the water consumption that is leaking in the flow of water in different parts of the system.	▪ differential measuring instruments such as flow meters; ▪ speed of flow Pito pipes (speed flow meter pito pipes); ▪ flowmeter and consumption meter differentials of Venturi; ▪ full range of flow meters
Water pressure. It allows to detect leaks at water pressure, eliminate excessive water consumption and ensure the stable operation of the system.	▪ Burdon pressure gauges with cartridge tube discharge nozzle; ▪ diaphragams; ▪ pieroresistive sensors; ▪ sylfons
Input power of electric motor. Measuring the input power allows you to determine the optimal performance of the electric motor with a fig.	▪ Ampermeters; ▪ Valtmeters; ▪ Coefficient of performance meter capacity.
Frequency of rotation of the pump Measuring the speed of the pump allows you to determine the optimal performance of the electric motor with a fig.	Stroboscopical source of light
ıssport data of equipment ▪ Rated current rated current rated current rated current and rated current rated speed; ▪ Pressure on the pump and its speed; ▪ It is important in determining the efficiency of the equipment.	Current control
Pressure The pumping utensil should be adjusted based on the system pressure requirements.	Estimation

The disadvantage is that the maximal voltage could be increased under conditions defined for a given period of time without exceeding the acceptedcurbs of temperature and stress in a manufacturing unit, power plant, or other electrical apparatus. In the context of the report, the terms “power” and “pure summer power” may change. The potentiality of the power generator in this report is based on the use of data from all net summer capacity.

Cogeneration-the serial manufacturing of electrical energy and useful thermal energy from the same power source. Cooperative (cooperative Power Supply Enterprise) - a group of persons who established a joint venture for the purpose of supplying electricity to the specified territory. Such enterprises are usually exempt from Federal income tax laws. Many cooperatives have been funded by the rural electrificationDepartment, now referred to as the administration of Rural

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Utilities.

III. Results

Electrical utilities-a large electrical supplier enterprise, primarily engaged in the production, distribution or transmission of electrical energy for use by the public and within a specified service area. Electric utilities include farm-owned organizations, publicly owned, jointly owned, and state owned (municipal, federal agencies, state projects, state electric circuits) systems. Under the municipal regulatory policy, the law of 1978 in the field of power supply is considered important in the experiences of qualifying institutions.

The Energy Policy Act 1992 is the launch of a new class of self-sufficient Electricity Producers called free wholesale producers. EPAST is designed to encourage competition in energy markets by significantly expanding the authority of FERS to order access to signals. The profit from such a sale is not regulated. Free wholesale manufacturer- water users associations is exempt from corporate organizational restrictions. Federal Energy Regulatory Commission - an independent agency created within the Department of energy (October 1, 1977), defined as the regulatory body of the FERS [6]. The Three Gorges Dam in China, which holds back the Yangtze River, is the largest hydroelectric dam in the world, in terms of electricity production. The dam is 2,335 meters long and 185 meters tall, and has enough generators to produce 22,500 megawatts of power[7].

IV. Discussion

In Namangan, Bukhara, and Khorezm regions, solar photoelectric power plants with a grand total capacity of 500 MW are going to be built on the basis of concept of Public-Private Partnership. The commencement of the project is planned for February 2021 year. The Ministry of Energy announced the beginning of the third project *"Scaling Solar 3"* on the establishment of a solar photoelectric station (PeS) on the basis of a private-publiccooperation. Within the structure of this project, it is planned to build three PeS with a total capacity of 500 MW and their investors will be determined according to the results of the tender. The beginning of this scheme is planned for February 2021. PeS construction is planned to be carried out in Bukhara, Namangan, Bukhara, and Khorezm regions. On 18 October, 2019, Masdar (UAE) won the tender for the construction of PeS with a capacity of 100 MW in Navoi region within the framework of the *"Scaling Solar 1"* project. An agreement has been concluded between the government of Uzbekistan and the International Financial Corporation on the attraction of consulting services and the increase of solar power by up to 1000 MW on the scalar project. As a result of the agreement, a tender was announced for the construction of 2 "Scaling Solar 2" PeS with a total capacity of 400 MWin Samarkand and Jizzakh regions in 2020[8].

A large-scale renewable energy strategy has been carried out by the Republic of Uzbekistan, within the bounds of the framework of which it is aimed at development of environmentally friendly solar energy up to 5 GW in the next 10 years. The master plan is targeted at meeting the increasingneed for electricity and is being implemented within the framework of the concept of providing the Republic of Uzbekistan with electricity in 2020-2030. The solar

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energy could be appled both in the production of heat and in the production of electrical energy. In the first case, flat non-concentrated collars of solar origin are used.

Conclusion

In the evolution of the strategy concept, a bunch of factors have changed from June 2018 to December 2019, before the implementation of mass hearings from January to August 2019. The policy in the field of macroeconomic indicators and statistics (the decision "On additional measures to ensure openness and transparency of Public Administration, increase the statistical potential of the country") has been updated, certain reforms are being carried out, new normative documents have been adopted (the law "On privatization of land areas not intended for agriculture", the resolutions of the Cabinet of Ministers, Ministry of Agriculture and Ministry of and Water resources of the Republic of Uzbekistan №03/1-1622 were adopted.

Despite the above-mentioned updates, the concept of program remains relevant in terms of selected strategic priorities and the direction of development as a whole. Here it plays an important role in improving the teaching methodology of energy supply issues in agriculture and water economy.

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