GREEN ENERGY IS THE PILLAR OF THE FUTURE

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Abstract: *In this article, the main issue is the energy crisis in the field of energy today, environmental and social problems are thoroughly studied, and in the future, we will focus on the types of energy called green energy that does not pollute the atmosphere by reducing environmental waste. The author focused on the opinions on hydrogen energy, its storage, production and use, which is currently supported by many countries. The article also talks about the expected energy future of the World Energy Organization in the next 30 years.*

Key words: *green energy, future energy, hydrogen energy, wind energy, solar energy, hydropower, geothermal energy, wave energy, landfill gas, biofuel.*

It is known that in 2019, Uzbekistan adopted the strategy of transition to "Green economy". It envisages a sharp reduction of carbon consumption in the country in the next ten years, the introduction of environmentally friendly and resource-saving technologies in all sectors of the economy, and the wide use of renewable and efficient energy sources. — is losing at least 4.5 percent of the gross domestic product every year due to the use of oil, gas, and coal. In addition, about half of the country's power generation

capacity is obsolete. Their restoration or modernization requires a lot of money. Instead, it is much better to switch to "green energy", which is both economically and ecologically effective. After all, the whole world is choosing this path. It is noteworthy that Uzbekistan was the first among the Central Asian countries to join this movement. In essence, the strategy of transition to "Green economy", adopted two years ago, means that our country is moving towards "green development". On December 27 of this year, the President of the Republic of Uzbekistan Shavkat Mirziyoyev launched major joint projects in the field of "green energy". participated in the launch ceremony. In it, the head of our state made important comments about the strategic program for the development of "green energy" in the country until 2030.

We started by consulting with the leading experts of the Asian Infrastructure Investment Bank and the European Bank for Reconstruction and Development. At the same time, by making changes to a number of legal documents and adopting new decisions, a solid legal framework based on market principles was created in the energy sector. Administrative and command mechanisms and monopoly were abandoned in the field, and a modern managed open and transparent system was adopted. Favorable opportunities have been created for the entry of private sector and foreign companies.

Solar energy - Uzbekistan is a sun-loving country, and taking into account its geographical location, the possibilities of using solar energy are huge. Solar energy is the most popular alternative to green energy. At the same time, in most regions of our country there are about 300 sunny days, from which 3000 hours of sunlight are received, and if this sunlight is converted into electrical energy, it is equal to several thousand trillion kilowatts.

Thanks to this, it is possible to solve the increasing energy problem in Uzbekistan. Wind energy - Wind energy produced by windmills in open areas of the Earth is also a good alternative to green energy. Wind energy has emerged as an unsuccessful alternative to renewable energy in Uzbekistan. Hydropower - Water is an important natural resource and is also a major source of green energy, which includes tidal power, wave power and hydropower. In Uzbekistan, water energy is known as hydropower. In its report, the International Energy Agency (IA) called hydropower the "forgotten god of clean energy" and urged countries to include it as an energy source to achieve zero emissions. Taking into account the displacement of dams and damage to the environment, if hydropower is used properly, Uzbekistan can achieve its goal of zero carbon emissions by 2070. Geothermal energy - Electric energy produced with the help of heat in the interior of the Earth is called geothermal energy. Tidal Energy - Electricity is generated from waves that hit the oceans. It is infinite because it is free from contamination. Biofuel is any hydrocarbon fuel produced from organic matter in a short period of time (days, weeks or months). For example, ethanol, biodiesel, green diesel and biogas, etc. Compared to traditional fossil fuels, biofuels contain no sulfur and contain less carbon monoxide and toxic emissions. Uzbekistan has a large amount of agricultural land, so the country has a strong potential for biofuel production. Biofuels help rural and agricultural development as new crops and help reduce pollution. Landfill gas Landfill gas (LFG) is a natural byproduct of the decomposition of organic matter in landfills. Instead of being released into the atmosphere from the growing landfill waste in cities, it can be harvested and converted and used as a source of energy. The city helps reduce odors and other hazardous waste from landfills and prevents methane from escaping into the atmosphere. Renewable energy resources

currently account for 26% of the world's electricity, but according to the IEA, its share is expected to reach 30% by 2024. The recovery followed a global slowdown in 2019 due to lower technology spending and environmental concerns. Future renewables are predicted to increase global solar capacity to 600 gigawatts (GW) by 2024, nearly double Japan's total installed electricity capacity. Overall, renewable electricity generation is projected to grow by 1,200 GW by 2024, which is about the same as the total electricity generation of the United States. Hydrogen is a clean fuel, and only water is produced when it is consumed in a fuel cell. Hydrogen can be produced from a variety of local resources, including natural gas, nuclear power, biomass, and renewable energy such as solar and wind. These qualities make it an attractive fuel option for transportation and power generation. It can be used in many applications in cars, homes, portable power and more. The energy of the future, which is currently the cause of many discussions, is hydrogen energy: Hydrogen is an energy carrier that can be used to store, transport and deliver energy produced from other sources. can be produced. Today, the most common methods are natural gas reforming (thermal process) and electrolysis. Other methods include solar energy and biological processes. Hydrogen energy involves the use of hydrogen or hydrogen-containing compounds to produce energy that can be delivered for any practical purpose. Advantages of hydrogen energy: High energy efficiency, Great environmental and social benefits, Economic competitiveness. Currently, the world economy is experimenting with hydrogen energy in all sectors: Energy production, storage and distribution; Electricity, heating and cooling for buildings and households; Industrial networks; Transportation; Extraction and Production of Raw Materials Thermal Process Thermal processes for hydrogen production typically involve steam reforming, a high-temperature process in which

steam reacts with hydrocarbon fuel to produce hydrogen. Many hydrocarbon fuels can be reformed to produce hydrogen, including natural gas, diesel, renewable liquid fuels, gasified coal, or gasified biomass. Today, about 95% of all hydrogen is produced by steam reforming of natural gas. Electrolytic processes Water can be split into oxygen and hydrogen by a process called electrolysis. In an electrolyzer, which works in the opposite direction like a fuel cell, electrolytic processes take place - instead of using the energy of a hydrogen molecule, like a fuel cell, the electrolyzer produces hydrogen from water molecules. uses There are several solar energy processes, including photobiological, photoelectrochemical, and solar thermochemistry. Photobiological processes use the natural photosynthetic activity of bacteria and green algae to produce hydrogen. Photoelectrochemical processes use special semiconductors to split water into hydrogen and oxygen. Solar thermochemical hydrogen production uses concentrated solar energy to drive water splitting reactions, often with other species such as metal oxides. Biological processes Biological processes use microbes such as bacteria and microphages and can produce hydrogen through biological reactions. In microbial biomass conversion, microbes break down organic matter such as biomass or wastewater to produce hydrogen, while in photobiological processes, microbes use sunlight as an energy source.

REFERENCES.

1. Yulchiev M.E., & Odilov.S. (2024). DESIGN ISSUES OF AUTOMATION SYSTEMS AND THEIR FUNCTION. *Лучшие интеллектуальные исследования*, *21*(2), 160–164. Retrieved from https://web-journal.ru/index.php/journal/article/view/5372

2. Yulchiev M.E., & Odilov.S. (2024). ANALYSIS OF THE AUTOMATION PROCESS OF TWO-RATE CONSUMERS. *Лучшие интеллектуальные исследования*, *21*(2), 171–174. Retrieved from https://web-journal.ru/index.php/journal/article/view/5374
3. Yulchiev M.E., & Odilov.S. (2024). ANALYSIS OF THE AUTOMATION PROCESS OF TWO-RATE CONSUMERS IN ELECTRICITY SUPPLY. *Лучшие интеллектуальные исследования*, *21*(2), 165–170. Retrieved from https://web-journal.ru/index.php/journal/article/view/5373
4. Yulchiyev Mash'albek Erkinovich, & Yusupov Asadbek G`ulom o`g`li. (2024). LIGHTING IN PRODUCTION AND ITS STANDARDS. NATURAL AND ARTIFICIAL LIGHTING. *Лучшие интеллектуальные исследования*, *14*(2), 110–115. Retrieved from https://web-journal.ru/index.php/journal/article/view/2898
5. Muhtorovich, K. M., & Abdulhamid o'g'li, T. N. DETERMINING THE TIME DEPENDENCE OF THE CURRENT POWER AND STRENGTH OF SOLAR PANELS BASED ON THE EDIBON SCADA DEVICE.
6. Abdulhamid o'g'li, T. N., & Sharipov, M. Z. (2023). ENERGY DEVELOPMENT PROCESSES IN UZBEKISTAN. Science Promotion, 1 (1), 177–179.
7. Abdulhamid o'g'li, T. N. Raxmonov Azizbek Botirjon o'g'li, & Musiddinov Otabek Ulug'bek o'g'li.(2022). STIRLING ENERGY GENERATOR. E Conference Zone, 13–16.
8. Topvoldiyev Nodirbek Abdulhamid o'g'li, & Komilov Murodjon Muhtorovich. (2022). Stirling's Engine. *Texas Journal of Multidisciplinary Studies*, *9*, 95–97. Retrieved from https://zienjournals.com/index.php/tjm/article/view/1932

9. Abdulhamid o‘g‘li, T. N. Davronov Akmaljon Abdug ‘ani o‘g‘li.(2022). Stirling Engine and Principle of Operation. Global Scientific Review, 4, 9–13.
10. Erkinovich, Y. M. A., & Asadbek Gulom og, Y. (2024). LIGHTING IN PRODUCTION AND ITS STANDARDS. NATURAL AND ARTIFICIAL LIGHTING. *Лучшие интеллектуальные исследования*, *14*(2), 110-115.
11. Erkinovich, Y. M. A. (2024). PROBLEMS OF EFFECTIVE USE OF ELECTRICAL ENERGY IN AGRICULTURE AND WATER MANAGEMENT. *Лучшие интеллектуальные исследования*, *14*(2), 72-78.
12. Erkinovich, Y. M. A., & Sirojiddin, X. (2024). AUTOMATION OF ELECTRICITY CONSUMERS. *Лучшие интеллектуальные исследования*, *14*(2), 86-92.
13. Erkinovich, Y. M. A., & Sirojiddin, X. (2024). WHAT DOES IT DEPEND ON TO ENSURE THE CONTINUITY OF ELECTRICITY CONSUMPTION. *Лучшие интеллектуальные исследования*, *14*(2), 100-104.
14. Erkinovich, Y. M. A., & Umurzoqbek, D. (2024). APPLICATION OF HYBRID SYSTEM IN MULTIFUNCTIONAL DEVICES USING BOTH RENEWABLE AND CONVENTIONAL ENERGY RESOURCES. *Лучшие интеллектуальные исследования*, *14*(2), 226-233.
15. Erkinovich, Y. M. (2024). TYPES OF LIGHTING LAMPS AND THEIR CHARACTERISTICS. *Лучшие интеллектуальные исследования*, *14*(2), 28-34.
16. Topvoldiyev Nodirbek Abdulhamid o‘g‘li, & Soliyev Muzaffar Mominjan’s son. (2024). WASTE OF ELECTRICAL ENERGY IN LINES AND TRANSFORMERS. *Лучшие интеллектуальные исследования*, *21*(2), 153–159. Retrieved from https://web-journal.ru/index.php/journal/article/view/5345
17. Abdulhamid o‘g‘li, T. N., & Husanboy, S. (2024). SMALL FROM HYDROELECTRIC POWER STATIONS IN USE THE WORLD EXPERIENCE. *Лучшие интеллектуальные исследования*, *21*(1), 110-114.

18. Topvoldiyev Nodirbek Abdulhamid o‘g‘li, & Shavkatbekov Husanboy. (2024). VILLAGE HOUSEHOLD FOR SMALL HPPS CURRENT TO DO CONDITION IN UZBEKISTAN. *Лучшие интеллектуальные исследования*, *21*(1), 115–119. Retrieved from https://web-journal.ru/index.php/journal/article/view/5284
19. Topvoldiyev Nodirbek Abdulhamid o`g`li, Utkirbek Akramjonovich Axmadaliyev, & Karimberdiyev Khikmatillo Qahramonjon ugli. (2024). DEVELOPMENT AND APPLICATION OF 3rd GENERATION SOLAR ELEMENTS. *Лучшие интеллектуальные исследования*, *14*(2), 219–225. Retrieved from https://web-journal.ru/index.php/journal/article/view/2916
20. Topvoldiyev Nodirbek Abdulhamid o`g`li, & Shavkatbekov Husanbor Azamjon o`g`li. (2024). IMPLEMENTATION OF SMALL HYDROPOWER PLANTS IN AGRICULTURE. *Лучшие интеллектуальные исследования*, *14*(2), 182–186. Retrieved from https://web-journal.ru/index.php/journal/article/view/2910
21. Topvoldiyev Nodirbek Abdulhamid o`g`li, Utkirbek Akramjonovich Axmadaliyev, & Abdullajonov Muhammadqodir Botirjon o`g`li. (2024). A GUIDE TO SELECTING INVERTERS AND CONTROLLERS FOR SOLAR ENERGY DEVICES. *Лучшие интеллектуальные исследования*, *14*(2), 142–148. Retrieved from https://web-journal.ru/index.php/journal/article/view/2903
22. Topvoldiyev Nodirbek Abdulhamid o`g`li, Xolmirzayev Jasurbek Yuldashboyevich, & Xabibulayev Iqboljon Axmadjon ugli. (2024). SOLAR PANEL INSTALLATION REQUIREMENTS AND INSTALLATION PROCESS. *Лучшие интеллектуальные исследования*, *14*(2), 135–141. Retrieved from https://web-journal.ru/index.php/journal/article/view/2902
23. Topvoldiyev Nodirbek Abdulhamid o`g`li, Xolmirzayev Jasurbek Yuldashboyevich, & Tursunov Ro’zimuhammad Muhammadyunus ugli. (2024). ENERGY-EFFICIENT HIGH-RISE RESIDENTIAL

BUILDINGS. *Лучшие интеллектуальные исследования*, *14*(2), 93–99. Retrieved from https://web-journal.ru/index.php/journal/article/view/2895

24. Topvoldiyev Nodirbek Abdulhamid o`g`li, Xolmirzayev Jasurbek Yuldashboyevich, & Obidov Shaxzod Ozodjon ugli. (2024). SOLAR PANEL INSTALLATION REQUIREMENTS AND INSTALLATION PROCESS. *Лучшие интеллектуальные исследования*, *14*(2), 48–54. Retrieved from https://web-journal.ru/index.php/journal/article/view/2888
25. Topvoldiyev Nodirbek Abdulhamid o`g`li, Xolmirzayev Jasurbek Yuldashboyevich, & Najimov Abbosbek Mominjon ugli. (2024). SOLAR PANEL INSTALLATION REQUIREMENTS AND INSTALLATION PROCESS. *Лучшие интеллектуальные исследования*, *14*(2), 40–47. Retrieved from https://web-journal.ru/index.php/journal/article/view/2887