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2023

ILMIY ELEKTRON JURNAL MAXSUS SON

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INITIAL EFFORTS TO DEVELOP GREEN ENERGY AND GREEN GROWTH IN UZBEKISTAN

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Abstract. Today, it is clear to everyone that the natural resources of all the countries of the world are decreasing, and as a result of this, a number of economic problems arise. The transition to green energy and the promotion of sustainable development have become global priorities in response to the pressing challenges of climate change and environmental degradation. This abstract focuses on the initial efforts made by Uzbekistan towards developing green energy and fostering green growth within its borders.

Uzbekistan, as a developing country, is faced with the dual challenge of meeting its increasing energy demand while simultaneously reducing greenhouse gas emissions and environmental impact. Recognizing these challenges, the government has embarked on a path towards a more sustainable and greener future. By examining the experiences of Uzbekistan in its early stages of green energy development, this study contributes to the broader understanding of the opportunities and challenges faced by developing countries in pursuing sustainable development goals. It provides valuable insights that can guide policymakers, researchers, and practitioners in Uzbekistan and beyond, as they seek to accelerate the adoption of green energy and promote sustainable growth in their respective contexts

Keywords. Natural resources, low carbon energy, energy resources, GDP, electricity, green economy, green growth, sustainable development, Uzbekistan, renewable energy, energy efficiency, environmental sustainability, climate change, sustainable practices.

ПЕРВЫЕ УСИЛИЯ ПО РАЗВИТИЮ ЗЕЛЕННОЙ ЭНЕРГЕТИКИ И ЗЕЛЕНОГО РОСТА В УЗБЕКИСТАНЕ

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Аннотация. Сегодня всем ясно, что природные ресурсы всех стран мира сокращаются, и в результате этого возникает ряд экономических проблем. Переход к зеленой энергетике и содействие устойчивому развитию стали глобальными приоритетами в ответ на насущные проблемы изменения климата и деградации окружающей среды. В настоящем резюме основное внимание уделяется первоначальным усилиям, предпринятым Узбекистаном по развитию зеленой энергетике и стимулированию зеленого роста в пределах своих границ.

Узбекистан, как развивающаяся страна, сталкивается с двойной задачей: удовлетворить растущий спрос на энергию, одновременно сокращая выбросы парниковых газов и воздействие на окружающую среду. Признавая эти проблемы, правительство встало на путь к более устойчивому и зеленому будущему. Изучая опыт Узбекистана на ранних этапах развития зеленой энергетике, данное исследование способствует более широкому пониманию возможностей и проблем, с которыми сталкиваются развивающиеся страны в достижении целей устойчивого развития. Он предоставляет ценную информацию, которая может помочь политикам, исследователям и практикам в Узбекистане и за его пределами, поскольку они стремятся ускорить внедрение зеленой энергетике и способствовать устойчивому росту в своих соответствующих контекстах.

Ключевые слова. Природные ресурсы, низкоуглеродная энергетика, энергоресурсы, ВВП, электроэнергия, зеленая экономика, зеленый рост, устойчивое развитие, Узбекистан, возобновляемые источники энергии, энергоэффективность, экологическая устойчивость, изменение климата, устойчивые практики.





O‘ZBEKISTONDA YASHIL ENERGIYA VA YASHIL O‘SISHNI RIVOJLANTIRISH BO‘YICHA DASTLABKI HARAkatLAR

Najmiddinov Yakhyo Fazliddin o‘g‘li

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“Yashil iqtisodiyot va barqaror biznes” kafedrasida assistenti

Annotatsiya. Bugungi kunda dunyoning barcha davlatlarida tabiiy resurslar kamayib borayotgani va buning natijasida bir qancha iqtisodiy muammolar yuzaga kelayotgani barchaga ayon. Yashil energiyaga o‘tish va barqaror rivojlanishni rag‘batlantirish iqlim o‘zgarishi va atrof-muhit degradatsiyasining dolzarb muammolariga javoban global ustuvor vazifalarga aylandi. Ushbu abstrakt O‘zbekistonning yashil energetikani rivojlantirish va uning chegaralarida yashil o‘shni rag‘batlantirishga qaratilgan dastlabki sa‘y-harakatlariga qaratilgan.

O‘zbekiston rivojlanayotgan davlat sifatida o‘zining ortib borayotgan energiyaga bo‘lgan talabini qondirish bilan bir vaqtda issiqxona gazlari chiqindilari va atrof-muhitga ta‘sirini kamaytirish kabi ikki tomonlama muammoga duch kelmoqda. Ushbu muammolarni tan olgan hukumat yanada barqaror va yashil kelajak sari yo‘lga tushdi. O‘zbekistonning yashil energetika rivojlanishining dastlabki bosqichidagi tajribasini o‘rganib, ushbu tadqiqot barqaror rivojlanish maqsadlariga erishishda rivojlanayotgan mamlakatlar duch keladigan imkoniyatlar va muammolarni kengroq tushunishga yordam beradi. U O‘zbekistondagi va undan tashqaridagi siyosatchilar, tadqiqotchilar va amaliyotchilarga yashil energiyadan foydalanishni jadallashtirish va o‘z sharoitlarida barqaror o‘shni rag‘batlantirishga intilayotganda yo‘l-yo‘riq ko‘rsatishi mumkin bo‘lgan qimmatli fikrlarni taqdim etadi.

Kalit so‘zlar. Tabiiy resurslar, kam uglerodli energiya, energiya resurslari, YaIM, elektr energiyasi, yashil iqtisodiyot, yashil o‘sh, barqaror rivojlanish, O‘zbekiston, qayta tiklanadigan energiya, energiya samaradorligi, ekologik barqarorlik, iqlim o‘zgarishi, barqaror amaliyot.

Introduction:

In recent years, the global community has been increasingly focused on addressing the challenges posed by climate change and environmental degradation. As countries strive for sustainable development and a more environmentally friendly future, the promotion of green energy and green growth has gained significant importance. Uzbekistan, as a developing country with a growing energy demand, faces the need to balance economic growth with environmental considerations. This introduction provides an overview of the initial efforts undertaken by Uzbekistan to develop green energy and foster green growth within its borders. It outlines the importance of transitioning to green energy sources and promoting sustainable practices to mitigate the environmental impact and ensure long-term sustainable development. One of the unique aspects of the green economy is the attempt to satisfy the wants, needs, and requirements of the country’s population to the maximum extent, in exchange for the rational use of natural resources, without reducing the country’s production process. Today, each country is trying to emphasize a specific area of the green economy based on its socio-demographic situation. Also, in order to ensure green economy and green growth in our country, a number of targeted action plans have been developed for the next 10 years. It should also be emphasized that the opportunities for low-carbon electric energy production in our country are very good, therefore, it is the need of the hour to establish a wide network of this type of production. President of our country Sh. M. Mirziyoyev signed from the decree No. PF-27 by “On the state program for the implementation of the new development strategy of Uzbekistan for the years 2022-2026 in the year of attention to people and quality education” [1] we can find out. Objectives 21, 22, and 24, which are defined as the priority tasks of this decree, are defined as goals for the rapid development of the economy in our country and the achievement of continuous electricity supply. Also, in our country, the decision of the President of the Republic of Uzbekistan PQ-4477 of October 4, 2019 “On approval of the strategy of the transition to the “Green” economy of the Republic of Uzbekistan in the period of 2019-2030” [2] reveals its importance. Understanding Uzbekistan’s initial efforts in green energy development provides valuable insights for other developing countries facing similar challenges. By examining the experiences of Uzbekistan, policymakers, researchers, and practitioners can gain





► **Tadbirkorlikni rivojlantirish**

knowledge and guidance towards the adoption of sustainable energy policies and practices. This study contributes to the broader understanding of the opportunities and challenges associated with green energy and green growth.

Methods:

There are many diversity of methods exist to illustrate our discussion results, but we have used these types of methods to write this article. **Literature Review:** Conducting a comprehensive review of existing literature on green energy and green growth in Uzbekistan provides a foundation of knowledge on the subject. This involves studying academic papers, reports, government publications, and other relevant sources to understand the context, policies, and initiatives related to green energy and green growth in Uzbekistan. **Data Collection and Analysis:** Gathering and analyzing relevant data is essential to assess the progress and outcomes of the initial efforts. This can involve collecting data on energy consumption, renewable energy capacity, greenhouse gas emissions, economic indicators, and other relevant variables. Data can be collected from government reports, statistical databases, industry reports, and expert interviews, among other sources. **Comparative Analysis:** Comparing Uzbekistan’s efforts with those of other countries or regions facing similar challenges allows for drawing lessons and identifying best practices. This can involve examining policies, regulations, incentives, and outcomes from different contexts to understand what has worked well elsewhere and assess their adaptability in the Uzbekistani context. By employing a combination of these research methods, a comprehensive understanding of the initial efforts to develop green energy and green growth in Uzbekistan can be achieved, providing insights into the progress, challenges, and potential for future development.

Literature Review:

Like many countries around the world, Uzbekistan has embarked on a strategy to transform its energy system to a “Green Energy Economy” (GEE). Although the green economy has a legacy from Limits to Growth arguments (Meadows 1972) [3] and the Blueprint of a Green Economy (Pearce 1989) [4], current iterations of the green economy entered mainstream policy discourse towards the end of the 2000s, notably at the Rio+20 conference (Bina 2013) [5]. Later, the world business council on sustainable low carbon economies, international cooperation will be crucial in areas such as the development and diffusion on clean technologies and the development of an international market for ecofriendly goods and services.

There is a range of discursive approaches to the green economy. For example, Bina (2013) [6] divides these into three categories – “business as usual”, “Greening”, “All challenges”, while Ferguson (2015) [7] similarly has “conventional pro-growth”, “Selective growth” and “Limits to the growth”. Both authors indicate that in reality these are points on a spectrum of interpretations of the green economy from market-led, business as usual through to proposals for more radical changes such as a steady state economy and upgrading (Kenis and Lievens 2015) [8].

The past years of economic reforms have paid dividends for Uzbekistan and the country is now well positioned for the next phase of market-oriented reforms. The efforts have paid off, and people in Uzbekistan are now experiencing an improvement in well-being and prosperity. The next phase of economic reforms will aim to reduce poverty in half and make Uzbekistan an upper-middle-income country (UMIC) by 2030 [9]. By taking on green objectives as part of the economic transition, Uzbekistan can reinforce the transition and increase its benefits. As part of collective action on climate change, countries will adopt low-carbon policies and global demand for fossil fuels will gradually decrease. An analysis of the impact on carbon-intensive exports finds that Uzbekistan’s GDP and welfare will be substantially affected. Under various scenarios of policy coordination among Uzbekistan’s major export markets, including through border taxes for carbon-intensive products, up to 40 percent of Uzbekistan’s natural gas and petroleum exports could be affected by 2050 [10]. However, Uzbekistan can mitigate this impact by taking on its own low-carbon policies. A low-carbon policy package will provide the necessary incentives for the shift toward low-carbon energy and energy efficiency. A starting point will be to reduce large energy subsidies currently embedded in various forms of government support for state enterprises, followed by carbon taxes or equivalent pricing for fossil fuels. In this article we have tried to contrast low carbon energy production in the nearest past.



Results and discussions:

A measure aimed at approving the long-term target indicators of the development of the field of renewable energy sources, as well as determining their location, taking into account the technical aspects of safe integration of new power generation facilities using renewable energy sources into the unified electricity system of Uzbekistan every year activities are carried out on a large scale in our country on the basis of specific goals. If we look at our country's low-carbon electricity in recent years, we can see that it is increasing year by year. This is a good result, but still, if we look at the total electricity supply, more than 90% of electricity is obtained in the traditional way, and the share of low-carbon electricity is less than 9%, which is certainly not a perfect situation for our country [11]. The low-carbon electricity development network includes the following areas: nuclear energy and renewable energy. Renewable sources include hydropower, solar, wind, geothermal, bioenergy, wave and tidal. In Uzbekistan there is no nuclear energy power stations, so all low carbon energy resources are taken from the renewable energy resources. In the table 1, you can see annual production of low carbon electricity in Uzbekistan from 2013 till 2021 [12]. In the table you can see that low carbon electricity production has been decreased somehow in recent years, but for the next 10 years we have concrete target in terms of producing low carbon electricity. To get this aim, year by year we have action plans to implement them on publicly.

Table 1

Low carbon energy production in Uzbekistan from 2013 to 2021y.

Years	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual production (in TWh)	6	6	7	7	8	6	6	5	5
Per capita production (in kWh)	189	197	226	230	261	180	196	149	147
Share of total electricity (in percentage)	10,95	11,40	12,83	12,95	14,38	9,84	10,76	8,95	8,46

Here TWh means Tera Watt hours and kWh means kilo Watt hours. This table created by the author by using data <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>; <https://ember-climate.org/data-catalogue/yearly-electricity-data/>; <https://ember-climate.org/insights/research/european-electricity-review-2022/>

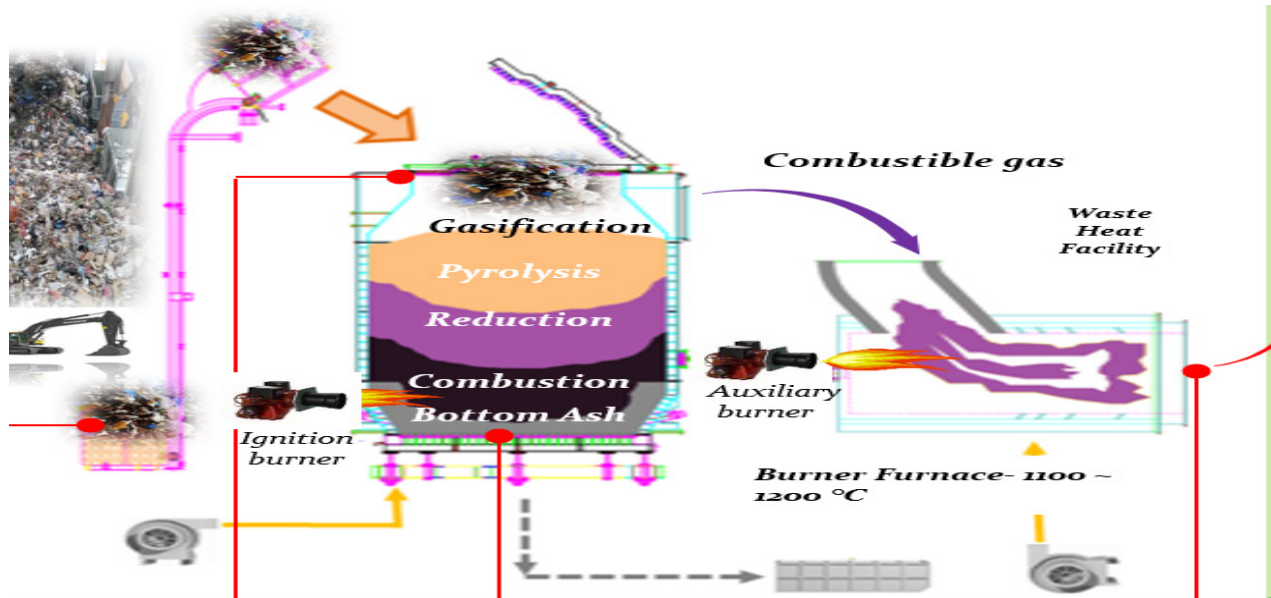
Uzbekistan has enough recourses and capacity to develop the green energy, green growth, low carbon energy and renewable energy. To tackle this problem we should pay attention to the following factors. Policy Initiatives and Regulations, Renewable Energy Capacity and Generation, Energy Efficiency Measures, Sustainable Practices in Industry and Agriculture, Socio-economic Impacts. These results and discussions provide a starting point for understanding the progress, challenges, and opportunities in the initial efforts to develop green energy and green growth in Uzbekistan. Further research, analysis, and stakeholder engagement are necessary for a comprehensive and nuanced understanding of the specific context and outcomes of these initiatives.

Low carbon energy is the one type of energy that supports the green economy and green growth. Many developed countries have already begun their electricity production in the form of low carbon energy. For example, one of the most developed countries in the world, Germany has many action plans in terms of electricity consumption and GEE concepts. Germany's present energy concepts aim to transform the entire energy system to a nonnuclear and almost carbon free sectors by 2050 [13].

There are two ways to get electricity from recycling. One of them is well developed in European countries, even in Germany. It is **Stoker type [14]** waste recycling. The other one is **Low-temperature gasification type [15]**. You can see **Low-temperature gasification type** recycling in the graph 1. It is developed in Korea and used in small scale. Both of them are somehow costly, but by installing one of them, we can tackle two problems at time. One of them is waste management and recycling,

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second one is low carbon electricity. Yes, it is some costly but should do it now. In order to develop this type of electricity, it is necessary to introduce a certain type of emissions fees to the production sectors operating in the country. By gathering emission fees from the organizations, it is possible to install **Low-temperature gasification type** to recycle waste and to get electricity from it. Today, it is possible to improve the living conditions of the population by diverting the monthly fees that the residents of Tashkent city pay for waste to the same type of waste processing industry, or by exporting it.



Graph 1. Low temperature gasification. [16]

This graph is created by the Korean company *HANKI INDUSTRIAL CO., Ltd.*

Other types of low carbon electricity are wave and tidal. We have two main rivers, Amudarya and Syrdarya. We should increase the importance of these types of electricity. We have an opportunity to use our rivers to produce the low carbon electricity. The climate and location of Uzbekistan is one of the favorable regions for receiving electricity from wind power plants. Therefore, it is necessary to increase the weight of wind power stations in a certain area. Also, the availability of mountainous areas in our country is one of the main factors for obtaining this type of electricity network.

Conclusion and suggestions:

We should pay attention another main part of the green economy, it is recycling process. It is one of the main problems in Uzbekistan. The reason for this is that recycling is not well developed. But, if we have learned well developed countries recycling process, we can tackle two main problems in Uzbekistan’s economy. On the one hand, we can develop recycling process without affecting to the environment. On the other hand, with the help of recycling, we can somehow solve the problem of low carbon electricity production in Uzbekistan. Uzbekistan has made significant initial efforts in developing green energy and promoting green growth. The government has implemented policies and regulations to incentivize renewable energy adoption, improve energy efficiency, and encourage sustainable practices in various sectors.

The country has seen a growth in renewable energy capacity and generation, showcasing the potential for further expansion based on available resources and policy support. The adoption of energy-efficient technologies and practices has also led to reduced energy consumption and greenhouse gas emissions.

Sustainable practices in industries and agriculture have demonstrated positive outcomes in terms of reduced environmental impact and improved productivity. These practices contribute to the overall goal of achieving sustainable development in Uzbekistan.

The initial efforts towards green energy and green growth have socio-economic benefits, such as job creation, improved energy security, and enhanced environmental sustainability. These initiatives

have the potential to contribute to other sustainable development goals and improve the quality of life for Uzbekistani citizens.

Continuously enhance policy frameworks: The government should review and update existing policies to create an enabling environment for green energy development. This includes setting ambitious renewable energy targets, implementing effective feed-in tariffs, and providing financial incentives to attract investment in the sector.

Strengthen institutional capacity: Building the capacity of relevant government agencies, research institutions, and industry stakeholders is crucial. Training programs, knowledge sharing platforms, and collaboration with international partners can help enhance expertise and facilitate technology transfer in green energy and green growth sectors.

Promote public awareness and participation: Educating the public about the benefits of green energy and green growth is essential. Awareness campaigns, community engagement, and public consultations can facilitate a better understanding of the importance of transitioning to sustainable practices and encourage public participation.

Foster private sector involvement: Encourage private sector engagement and investment in green energy projects through incentives, regulatory mechanisms, and public-private partnerships. This will not only drive innovation but also create economic opportunities and job growth.

Support research and development: Invest in research and development to foster innovation in green energy technologies, energy storage, and sustainability practices. Research institutions should collaborate with industry to develop cost-effective solutions and address specific challenges faced in the Uzbekistani context.

Collaboration and knowledge exchange: Actively engage with international organizations, regional partners, and other countries to learn from best practices and experiences in green energy development. Collaborative initiatives can assist Uzbekistan in accessing funding, technical expertise, and global networks for accelerated progress.

By implementing these recommendations, Uzbekistan can further advance its initial efforts towards green energy and green growth. This will contribute to sustainability, economic development, and a greener, more resilient future for the country.

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