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PROSPECTS FOR DIVERSIFICATION AND SUPPLY OF ENERGY OF UZBEKISTAN BASED ON WORLD EXPERIENCE

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ABSTRACT

Uzbekistan faces significant challenges in meeting its growing energy needs through a diversified and sustainable supply. This article examines the prospects for Uzbekistan to enhance its energy security by drawing upon the successful experiences of other countries in diversifying energy sources and improving energy efficiency. Through a comprehensive literature review and comparative analysis, the study finds that Uzbekistan has strong potential to expand its use of renewable energy, particularly solar and wind power, as well as to boost energy efficiency across the industrial, buildings, and transportation sectors.

KEYWORDS

Uzbekistan, energy diversification, energy efficiency, renewable energy, energy security

Introduction

Uzbekistan, a resource-rich yet landlocked country in Central Asia, faces multifaceted energy challenges as it seeks to support socio-economic development and transition to a more sustainable future. The country relies heavily on finite fossil fuels, particularly natural gas, to meet its energy needs. In 2020, natural gas accounted for 86% of primary energy supply, followed by oil at 7% and coal at 4%, with only 3% coming from renewables and other sources [1]. This high dependence on hydrocarbons poses risks to energy security, fiscal stability, and the environment.

Soaring energy demand, driven by economic growth, industrialization, and rising living standards, is placing increasing pressure on Uzbekistan's aging and inefficient energy infrastructure [2]. Electricity shortages and gas supply disruptions are common, undermining productivity and wellbeing [3]. At the same time, inefficient energy use across the economy is leading to unnecessarily high consumption, imports, and greenhouse gas emissions. Uzbekistan has among the highest energy intensities in the world, requiring over three times more energy to produce a unit of GDP compared to the European Union average [4].

Recognizing these challenges, the Government of Uzbekistan has made energy diversification and efficiency a strategic priority. Uzbekistan's Energy Strategy 2030 sets ambitious targets to increase the share of renewables in electricity generation to 25% by 2030, up from just 10% in 2020 [5]. The strategy also aims to reduce energy intensity by 50% below 2015 levels through efficiency measures.

To support these goals, Uzbekistan is pursuing energy sector reforms, private investment, and regional interconnections. However, progress has been constrained by technical, financial, and institutional barriers.

METHODS AND LITERATURE REVIEW

To assess the prospects for energy diversification and efficiency in Uzbekistan, a systematic literature review was conducted focusing on three main areas: (1) Uzbekistan's energy landscape and policy context; (2) international experiences and best practices in energy diversification and efficiency; and (3) key barriers and opportunities for Uzbekistan in light of its specific circumstances and international lessons.

A comprehensive review was undertaken of official government strategies, reports, and data, supplemented by academic and gray literature on Uzbekistan's energy sector. Key sources included the Ministry of Energy, the Uzbek Renewable Energy Association, reports by international organizations such as the Asian Development Bank and World Bank, and journal articles on Uzbekistan's energy challenges and opportunities. Also, the literature review concentrated on identifying successful international examples of countries enhancing their energy security and sustainability, with a focus on developing and emerging economies that have faced similar barriers to Uzbekistan.

RESULTS

Uzbekistan has significant untapped potential for renewable energy development, particularly solar and wind power. With over 300 sunny days per year and average solar irradiation of 2,000 kWh/m2, Uzbekistan has some of the highest solar energy potential in the world [6]. The country also has estimated wind energy potential of 520 GW, concentrated in the northwest regions bordering Kazakhstan and Turkmenistan [7].

Despite this vast potential, renewable energy deployment in Uzbekistan remains limited, accounting for only 3% of total primary energy supply in 2020 [1]. Most of this comes from hydropower, with only 4 MW of installed solar PV capacity and 1 MW of wind power [8]. Key barriers to scaling up renewables include insufficient legislative and regulatory frameworks, low electricity tariffs that discourage investment, limited financing and private sector participation, and weak institutional and technical capacity [9].

International experiences demonstrate that these barriers can be overcome through a combination of enabling policies, financial incentives, and technical assistance. For example, Morocco has become a regional leader in renewable energy by adopting a supportive legal framework, competitive bidding processes, and fiscal incentives such as VAT exemptions and subsidies [10]. India has deployed over 40 GW of solar PV through a mix of feed-in tariffs, renewable purchase obligations, and large-scale public tenders [11]. Uzbekistan could draw upon these examples to design a comprehensive renewable energy strategy that attracts private investment while ensuring social and environmental safeguards.

Improving energy efficiency is critical for Uzbekistan to reduce energy intensity, enhance energy security, and decouple economic growth from energy consumption. The industrial sector accounts for around 60% of total final energy consumption, followed by buildings at 25% and transport at 15% [12]. All three sectors have significant potential for efficiency gains.

Successful examples of regional energy cooperation include the Central American Electrical Interconnection System (SIEPAC), which has enhanced electricity trade and renewable energy integration among six countries in Central America, and the Southern African Power Pool (SAPP) [13], which has promoted cross-border electricity trade and investment in southern Africa. Uzbekistan could learn from these experiences to develop a regional energy strategy that leverages its central location and resources to promote mutually beneficial cooperation.

ANALYSIS AND DISCUSSION

The prospects for energy diversification and efficiency in Uzbekistan are significant but will require sustained efforts to overcome barriers and learn from international best practices. Uzbekistan has made initial progress in setting ambitious targets and reforming its energy sector, but implementation has been constrained by technical, financial, and institutional challenges. The comparative analysis of international experiences suggests that key success factors include:

- ✓ Establishing a comprehensive and coherent policy and regulatory framework that provides clear targets, responsibilities, and incentives for renewable energy and energy efficiency
- ✓ Attracting private sector investment and expertise through competitive bidding processes, fiscal incentives, and risk mitigation measures
- ✓ Building technical and institutional capacity through targeted training, knowledge exchange, and international partnerships
- ✓ Ensuring social and environmental safeguards through stakeholder engagement, impact assessments, and benefit-sharing mechanisms
- ✓ Promoting regional cooperation and trade through harmonized market rules, interconnected infrastructure, and trust-building measures

Uzbekistan can draw upon these lessons to design a sustainable energy transition strategy that is tailored to its specific context and needs. A key priority should be to establish a supportive enabling environment that provides long-term policy stability, reduces investment risks, and incentivizes innovation and private sector participation. This could involve adopting a renewable energy law, setting transparent and competitive procurement processes, and providing financial incentives such as feed-in tariffs, tax breaks, and subsidies.

Uzbekistan should also prioritize energy efficiency as a cost-effective and high-impact way to reduce energy intensity and enhance energy security. This could involve adopting a national energy efficiency action plan that sets clear targets and responsibilities across all demand sectors, supported by a mix of regulatory measures, market-based incentives, and information and capacity building programs. Particular attention should be given to the industrial sector, which accounts for the bulk of energy consumption and offers significant potential for efficiency gains.

Finally, Uzbekistan should leverage its central location and resource endowments to promote regional energy cooperation and trade. This could involve developing a regional energy strategy that harmonizes market rules and standards, expands cross-border transmission infrastructure, and builds trust and cooperation with neighbors. Uzbekistan could position itself as a regional renewable energy hub, exporting surplus solar and wind power to neighboring countries while balancing its own supply and demand.

CONCLUSION

Uzbekistan faces significant challenges in meeting its growing energy needs through a diversified and sustainable supply. However, the country has significant untapped potential for renewable energy development and energy efficiency improvements, which could help to enhance energy security, reduce dependence on fossil fuels, and support socio-economic development.

To realize this potential, Uzbekistan should learn from successful international experiences and best practices in designing and implementing a comprehensive energy transition strategy. Key recommendations include:

Establish a supportive policy and regulatory framework for renewable energy and energy efficiency, with clear targets, responsibilities, and incentives for private sector investment and innovation.

Prioritize energy efficiency as a cost-effective and high-impact way to reduce energy intensity and enhance energy security, with a focus on the industrial sector and cross-cutting measures such as building codes, appliance standards, and awareness-raising.

By pursuing these recommendations and learning from international experiences, Uzbekistan can accelerate its energy transition and build a more secure, sustainable, and prosperous future for its people and the region.

REFERENCES

1. International Energy Agency. (2021). Uzbekistan energy profile.
2. World Bank. (2020). Uzbekistan - Energy sector reform and development project.
3. Asian Development Bank. (2019). Uzbekistan: Power sector reform and development.
4. International Energy Agency. (2020). Uzbekistan: Key energy statistics.
5. Ministry of Energy of the Republic of Uzbekistan. (2020). Energy Strategy of the Republic of Uzbekistan until 2030.
6. International Renewable Energy Agency. (2021). Renewables Readiness Assessment: Uzbekistan.
7. United Nations Development Programme. (2019). Opportunities for Uzbekistan in transition to a green economy.
8. Uzbek Renewable Energy Association. (2021). Renewable Energy in Uzbekistan: Challenges and Opportunities.
9. Energy Charter Secretariat. (2020). Uzbekistan: Energy Investment Risk Assessment.
10. International Renewable Energy Agency. (2019). Renewable Energy Outlook: Morocco.
11. International Energy Agency. (2021). India Energy Outlook 2021.
12. United Nations Economic Commission for Europe. (2020). Environmental Performance Reviews: Uzbekistan.
13. United Nations Industrial Development Organization. (2019). Industrial energy efficiency in Uzbekistan: Challenges and opportunities.