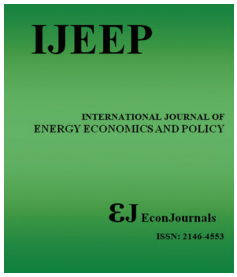

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# Governance Framework of Energy Transition in Uzbekistan

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**ABSTRACT**

Currently, Uzbekistan, a double-landlocked country in Central Asia, is facing an increasing number of environmental and energy-related problems such as worsening air quality, frequent electricity interruptions, high levels of old and inefficient infrastructure, and energy supply insecurity. They are all associated with an increasing population and a rapidly developing economy and may cause a slowdown in the country's economic growth. The study examines Uzbekistan's energy transition using the UNDP Energy Governance Framework. Applied methods and tools include content, thematic, policy, and stakeholder analysis. A comprehensive analysis was conducted across four focus areas: inclusive institutions, policy frameworks, civic engagement, and oversight mechanisms. Key findings highlight the need to strengthen institutional coordination, improve data quality, develop clear regulatory policies, increase stakeholder participation, and establish independent oversight bodies. Significant challenges remain in such areas as data quality, policy coherence, and civic engagement. Addressing these issues is crucial for Uzbekistan to successfully navigate its energy transition and to ensure long-term energy security while meeting sustainability goals. Applying the UNDP Energy Governance Framework can help address the challenges by promoting transparent, inclusive and sustainable energy governance. Recommendations include enhancing inter-ministerial collaboration, expanding renewable energy deployment, fostering community engagement, and building capacity of oversight institutions.

**Keywords:** Energy Transition, Uzbekistan, Energy Governance, Central Asia
**JEL Classifications:** Q38, Q48

## 1. INTRODUCTION

Uzbekistan is a doubly landlocked country located in Central Asia and surrounded by five countries. According to a recent World Bank report, Uzbekistan has emerged as the third fastest-expanding economy in Europe and Central Asia by 2024. Among the over 20 developing and emerging markets in the region, the nation's economic growth in 2024 ranks among the top three performers (World Bank, 2025).

Economic growth and development hinge on dependable and sufficient energy supply. Uzbekistan has substantial primary energy resources including abundant coal, oil, and gas reserves. The country's energy system is controlled by state-owned monopolies, with the government determining all energy prices, including those for electricity and natural gas. Artificially low domestic natural gas prices compared to international rates have led to inefficient energy use, resulting in Uzbekistan becoming one of the world's most energy- and carbon-intensive economies. As part of the government's comprehensive structural reform, the energy sector is undergoing changes to address rapidly increasing energy demand, enhance service quality, and draw private sector investments. Additionally, Uzbekistan has a significant potential to boost the efficiency and diversity of its domestic renewable energy resources. The government has demonstrated its commitment to transform the country's energy mix by establishing a goal to generate 25% of its electricity supply from renewable sources (International Energy Agency, 2025).

Uzbekistan's energy sector currently faces significant challenges in terms of sustainability, security, and affordability. The country's energy system is heavily reliant on fossil fuels, particularly natural gas, which accounts for the majority of energy production (Gómez et al., 2015; Mostafaeipour et al.,

2021). This dependence on non-renewable resources not only contributes to greenhouse gas emissions and environmental pollution but also raises concerns about the long-term sustainability of the energy supply as fossil fuel reserves are depleted. Interestingly, despite its heavy reliance on fossil fuels, Uzbekistan possesses substantial untapped renewable energy potential, especially wind energy. However, the renewable energy sector remains underdeveloped owing to the lack of coherent policies and the low price of natural gas. This contradiction highlights the need for a comprehensive energy transition strategy that addresses both the current dependence on fossil fuels and potential for renewable energy development. To ensure energy security and sustainable economic growth, Uzbekistan must diversify its energy balance and modernize its energy sector. The country's strategic directions for development include modernizing its electrical system, oil and gas sector, construction of a nuclear power plant, and gradual transition to renewable energy sources (Allaev et al., 2023). By implementing these measures, Uzbekistan can significantly reduce its primary energy consumption and $CO_2$ emissions. For instance, energy sector modernization could potentially reduce the cumulative primary energy consumption by 447 Mtoe and $CO_2$ emissions by 1155 Mt by 2040. This transition, while requiring substantial investment, is crucial for creating conditions for carbon-neutral energy in Uzbekistan's economy by the mid-21st century.

To help Uzbekistan address its main energy system challenges, different theoretical frameworks relevant to energy transitions in developing economies provide structured ways to understand and overcome obstacles. These frameworks allow policymakers, researchers, and stakeholders to analyze why issues exist, how transitions occur, and what interventions may work best within Uzbekistan's unique context, including overdependence on fossil fuels, especially natural gas, aging and inefficient infrastructure, underdeveloped renewable energy sector, high energy intensity (inefficient use of energy), regional energy disparities, particularly rural access and investment gaps, and policy uncertainty.

## 2. METHODS

Energy transition in developing economies is a complex and multifaceted process involving a shift from traditional, often fossil-fuel-based energy systems, to cleaner, more sustainable, and renewable sources (Choukri et al., 2017; Elsayed et al., 2023). Several theoretical frameworks have been developed to understand and guide this transition in such contexts, focusing on factors like social, economic, political, and institutional dimensions. Some key theoretical frameworks relevant to energy transition in developing economies are presented in Table 1.

Uzbekistan is actively pursuing strategies to transition its energy sector towards more sustainable sources, as it faces challenges related to energy security and climate change. Approaches to this transition emphasize a combination of traditional and innovative strategies to overcome existing barriers and achieve long-term goals. Uzbekistan is actively pursuing strategies to transition its energy sector towards more sustainable sources, as it faces challenges related to energy security and climate change. Theoretical approaches to this transition emphasize a combination of traditional and innovative strategies to overcome existing barriers and achieve long-term goals. One significant approach focuses on diversifying the energy balance by incorporating renewable and nuclear energy sources to ensure energy security and sustainable economic growth. The construction of a nuclear power plant and gradual shift towards renewable energy sources like solar and wind are strategic priorities for Uzbekistan's energy transition.[1] The integration of renewable and nuclear energy is projected to establish conditions for a carbon-neutral economy by the mid-21st century (Allaev et al., 2023). Additionally, Uzbekistan is attempting to control carbon emissions through various decarbonization measures. These include transitioning to renewable energy sources and integrating carbon capture, storage, and utilization technology. Such pathways offer potential for reducing greenhouse gas emissions and creating a low-carbon economy. Challenges like investment requirements, policy effectiveness, and technological readiness are discussed, emphasizing the importance of overcoming these to achieve sustainable energy transition (Turakulov et al., 2024). Overall, Uzbekistan's energy transition is a multifaceted process integrating traditional and innovative theoretical approaches that prioritize sustainable energy development, economic growth, and environmental resilience (Isakulova et al., 2024; Ayubova, 2023; Allaev et al., 2023).

The UNDP Energy Governance Framework stands out from other energy transition frameworks because it focuses on inclusive, equitable, and sustainable energy governance. While many energy transition frameworks as mentioned above concentrate on technical, economic, or environmental aspects, the UNDP framework places a significant emphasis on governance structures, policy coherence, and stakeholder participation. The key areas of the UNPD EGF are presented in the Figure 1.

1 International consortium to be established for nuclear power plant construction in Uzbekistan https://kun.uz/en/news/2025/02/11/international-consortium-to-be-established-for-nuclear-power-plant-construction-in-uzbekistan

**Figure 1:** Energy Governance: Priority focus areas and approaches for a just energy transition


Source: United Nations Development Programme, 2023

**Table 1: Key theoretical frameworks relevant to energy transition in developing economies**

| Title | Overview | Relevance for developing economies |
|---|---|---|
| Multi-Level Perspective (MLP) Source: Osunmuyiwa et al., 2017; Nikas et al., 2020 | MLP is a popular framework for understanding transitions, particularly in the context of sustainability. It suggests that societal transitions, like energy transitions, occur at three levels:<br>• Landscape: The broader, exogenous context (e.g., global climate change, international policies, economic trends).<br>• Regime: The established practices, institutions, and technologies that dominate (e.g., fossil-fuel energy systems, government policies, market structures).<br>• Niches: The emerging innovations, alternative practices, and technologies that disrupt the status quo (e.g., renewable energy technologies, decentralized grids). | Developing economies often face challenges at all three levels. For instance, in many cases, energy regimes are heavily reliant on fossil fuels or inefficient energy systems, and the niches for renewable energy might be underdeveloped. The MLP framework can help identify opportunities for niches (e.g., solar energy in rural areas) and how these innovations can scale up, supported by policy interventions and external pressures (e.g., international climate agreements). |
| Transition Management Source: He et al., 2022 | Transition Management is a governance approach focused on steering systems towards sustainable practices. It is a process of managing long-term transitions through policies, strategies, and continuous adaptive actions at different governance levels. This approach emphasizes the role of coordination and collaboration among different actors (governments, businesses, civil society, etc.). | Transition management helps guide systemic change through participatory governance and adaptive learning, which is crucial for developing economies where resources and institutional capacities might be limited. It can support the development of inclusive energy policies and help align local energy needs with global sustainability goals. |
| Sustainability Transitions Framework Source: Okedele et al., 2024 | This framework builds on understanding how societies move toward more sustainable energy systems, and it integrates environmental, social, and economic dimensions. It focuses on the role of governance structures, social innovations, and technological advances in fostering sustainability. The framework also emphasizes the importance of overcoming socio-technical lock-ins and creating enabling environments for innovation. | Developing economies often face socio-technical lock-ins that limit the adoption of renewable technologies (e.g., entrenched fossil fuel dependence, lack of infrastructure). This framework helps identify barriers to change and highlights opportunities for fostering systemic transformation, such as supporting local innovations and building sustainable business models in energy access. |
| Capabilities Approach Source: Dixon et al., 2010 | the Capabilities Approach focuses on human development and well-being. In the context of energy, it examines how access to modern energy services enhances people's capabilities (e.g., improving health, education, and economic opportunities). | For developing economies, the focus is on how energy transition can contribute to improving quality of life, reducing poverty, and empowering communities. The approach is useful for understanding the social dimension of energy access, particularly in marginalized communities. It emphasizes energy as a tool for enhancing people's freedoms and opportunities. |
| The Energy Justice Framework Source: Cholibois, 2020 | The Energy Justice Framework seeks to ensure that the benefits of energy systems are distributed fairly across society, emphasizing three main principles: distributional justice, procedural justice, and recognition justice. It considers how energy policies and transitions can address issues like energy access, affordability, and environmental justice. | Developing economies often experience severe energy access inequities, with rural and low-income communities facing the greatest energy poverty. This framework helps ensure that the benefits of energy transition reach all segments of society, focusing on equitable distribution of energy resources, fair participation in decision-making, and the recognition of marginalized voices in the energy transition process. |
| Socio-Technical Systems Framework Source: Geels, 2018 | This framework looks at the interdependencies between technology, society, and policy in shaping energy systems. It considers how technologies, infrastructure, human behavior, and policy interact to either support or hinder transitions. | In many developing economies, energy systems are influenced by a complex web of societal, political, and technological factors. The socio-technical systems framework helps to understand how technological innovations (e.g., solar panels, mini-grids) interact with local cultures, economic conditions, and governance structures, and how these interactions can either foster or impede the energy transition process. |
| Decentralized Energy Systems and Localized Transitions Source: Guta et al., 2017 | This approach focuses on decentralized, off-grid, or local energy solutions as a means of promoting energy access and sustainability. It advocates for localized energy systems that can cater to the specific needs and conditions of communities. | In developing countries, centralized energy infrastructure can be expensive and difficult to implement in rural areas. Decentralized energy solutions, such as solar mini-grids or household solar systems, are often more viable. This framework supports the idea of localized energy transitions that are more adaptable, cost-effective, and accessible for rural and underserved communities. |

The UNDP Energy Governance Framework is distinct from other energy transition frameworks because of its holistic focus on governance, inclusive policy-making, emphasis on institutional capacity, and close alignment with global SDGs. By prioritizing governance, equity, stakeholder participation, and context-specific solutions, it offers a unique approach to ensuring that energy transition is not only technically feasible but also socially just, environmentally sustainable, and resilient in the face of challenges. This makes them especially valuable for developing economies, where these factors are often critical to the success of energy transition efforts.

Applying the UNDP EGF is beneficial for Uzbekistan energy system as it provides a structured, inclusive, and sustainable

approach for managing the country's energy transition. The framework's emphasis on strong governance, equitable energy access, policy coherence, and alignment with global sustainability goals makes it suitable for addressing Uzbekistan's energy sector challenges. By adopting this framework, Uzbekistan can create a more resilient, inclusive, and environmentally sustainable energy system that supports economic development, reduces inequality, and contributes to global climate change goals.

## 3. RESULTS

Comprehensive analyses encompassing thematic, policy, and stakeholder dimensions were conducted to address all aspects of the UNPD EGF content. Each component of the UNPD EGF was examined to assess the current state-of-the-art and to identify potential obstacles to an effective energy transition.

### 3.1. Focus Area 1: Inclusive and Effective Institution

For Uzbekistan to successfully transition to a sustainable, competitive, and low-carbon energy system, inclusive and effective institutions need to be built. These institutions will not only facilitate policy and regulatory reforms, but also ensure that the energy transition is equitable, transparent, and participatory, benefiting all sectors of society.

Currently, Uzbekistan's energy sector is managed by several ministries, such as the Ministry of Energy (MoE), the Ministry of Economic Development and Poverty Reduction, the Ministry of Investment, Industry and Trade which handle energy policies, economic forecasting, and investment facilitation. Detailed analysis of the functions and interconnections of the ministries has revealed key actions aimed at fostering institutional coordination and the effective implementation of policies. They are highlighted in the Table 2.

Uzbekistan's public administration remains centralized and hierarchical, with the Presidential Administration, established in 2018, playing a central role in shaping and overseeing the strategic direction of governance. Efforts to decentralize governance to the regional and local levels are underway, supported by the Agency for Strategic Reforms. Recent reforms have reduced the number of executive bodies from 61 to 28, including a reduction in ministries from 25 to 21, and transferred several agencies to line ministries. The decree also emphasized increasing the independence and efficiency of ministries and promoting public-private partnerships. However, these changes have led to high personnel turnover and unclear mandates across ministries, slowing implementation. Effective reorganization requires clearly defined roles and responsibilities, potentially through legislation, to avoid duplication, improve accountability, and enhance policy delivery (OECD Public Governance Reviews, Uzbekistan, 2024).

As part of the 2030 Strategy, Uzbekistan is focusing on further enhancing the responsiveness of its public administration, especially in sectors such as education, health, social protection, youth politics, and digitalization of public services. Key progress has been made in digitalizing public services, with the E-Government portal, launched in 2013, offering over 60% of public services online. Uzbekistan's performance in digital services is reflected in its improvement in the E-Government Development Index (EGDI), which rose from 0.47 in 2014 to 0.73 in 2022, surpassing its neighbors but still behind Kazakhstan. However, challenges remain in increasing public awareness of online services and ensuring their widespread participation. Although over half of citizens believe that online services improve quality and save time and cost, many urban residents are unaware of these services, and rural populations face additional barriers due to infrastructure limitations. Despite progress in open government reforms, further efforts are needed to bridge these gaps and ensure wider access to digital public services (OECD Public Governance Reviews, Uzbekistan, 2024).

Although public trust in institutions plays a significant role in shaping energy policies and development in Uzbekistan and the broader Central Asian region, substantial research has focused on public trust in energy institutions in Uzbekistan. Regardless, this topic is highly important for local community development and increasing institutional transparency. It is worth noting that Uzbekistan's energy sector, like other Central Asian countries, faces challenges, such as limited infrastructure, political turmoil, payment difficulties, and inadequate energy policies (Dorian, 2005).

Additionally, although Uzbekistan has made efforts to improve its energy sector through structural transformations and investments, the role of public trust in institutions specifically related to energy policies remains unclear from the provided context. A country's energy development is part of a broader regional trend, where Central Asian nations are working to exploit their vast energy resources and become significant global energy suppliers (Dorian, 2005). Further research is needed to explore

**Table 2: Key actions aimed at fostering institutional coordination and the effective implementation of energy policies**

| Key actions | Description |
|---|---|
| Coordination Mechanisms | Establish clear coordination mechanisms between different ministries and agencies involved in energy governance. For example, the MoE should have a direct line of communication and collaboration with the Ministry of Economic Development and other stakeholders like the Ministry of Finance to ensure aligned policies that reflect both economic growth and sustainability goals. |
| Regulatory Agencies | Strengthen independent energy regulatory bodies to ensure that energy production, pricing, and distribution are managed transparently and efficiently. These bodies should have the authority to oversee compliance with regulations and help enforce market mechanisms, fostering a competitive energy market |
| Clear Roles and Responsibilities | Create a legal framework that defines the roles and responsibilities of each institution in the energy sector, ensuring that policies are effectively implemented and that governance is transparent. |

Source: Official web-sites of the Ministry of Energy, Ministry of Economy and Finance, Ministry of Economic Development and Poverty Reduction, Ministry of Investment, Industry and Trade of the Republic of Uzbekistan

the specific relationship between public trust and energy policies in Uzbekistan.

As Uzbekistan transitions to a more market-oriented energy sector, there may be concerns about fairness in decision-making, especially regarding energy pricing, privatization, and energy access. Key factors and strategies for building and maintaining public trust in energy institutions in Uzbekistan are presented in Table 3 below.

Quality data and information in another subtopic which must be properly addressed by the Uzbek government to support just energy transition. The energy sector in Uzbekistan faces several data limitations and challenges that affect the assessment and development of its energy resources. One of the primary issues is the lack of comprehensive and up-to-date information on renewable energy potential (Asfaw and Mirkasimov, 2024). While estimates exist for various renewable sources, they vary widely. For instance, small-scale hydropower potential estimates range from 275 MW to 30,000 MW, and solar PV potential from 195,000 MW to 3,760,000 MW. This significant variation in estimates highlights the need for more accurate and consistent data-collection methods. Despite its potential, the deployment of renewable energy in Uzbekistan remains minimal. Only 5-225 MW of small-scale hydropower has been implemented across five Central Asian countries, including Uzbekistan (Laldjebaev et al., 2021). This discrepancy between potential and actual deployment suggests limitations in data accuracy or accessibility, which may hinder effective policy making and investment decisions. In conclusion, Uzbekistan faces challenges related to data availability and reliability in its energy sector. The lack of accurate information on renewable energy potential, coupled with limited deployment data, creates obstacles for a country's transition to a more sustainable energy mix. Addressing these data limitations is crucial for Uzbekistan to plan and implement its energy strategies effectively, particularly as it aims to diversify its energy balance and ensure long-term energy security (Allaev et al., 2023).

### 3.2. Focus Area 2: Policy and Regulatory Framework

According to the UNPD EGF, to facilitate a timely and just energy transition, it is essential to use political economy analysis to understand the factors that influence policy formulation. This ensures the development of policies that are both effective and inclusive. Key actions include providing clear leadership and a vision to build trust and confidence with market players, such as customers, businesses, manufacturers, and investors. A strong legal and regulatory framework is necessary to mitigate the risks associated with renewable energy investments and to foster a favorable environment for sustainable technologies. To ensure effective implementation, a co-creation approach should be adopted to clearly define the roles and responsibilities of all the stakeholders. Awareness, communication, and robust monitoring and reporting mechanisms are crucial for accountability. Government coordination across institutions is necessary to maintain policy coherence and create a unified approach to energy transition. Such efforts will promote a stable, inclusive, and transparent transition to renewable energy (Rehman et al., 2024).

Uzbekistan's energy policy is focused on diversifying its energy mix, improving efficiency, and ensuring energy security, while transitioning towards a more sustainable and market-oriented sector. The country aims to become a leader in the energy sector in Central Asia by developing its nuclear and regulatory infrastructure in partnership with the International Atomic Energy Agency (IAEA) (Juraev and Tleumuratov, 2020). Energy security is a significant issue for the economic stability and competitiveness of Uzbekistan. The country is working to modernize its energy infrastructure, introduce market-based reforms, and attract both local and foreign investments to stimulate a competitive environment. Uzbekistan is also investing in renewable energy sources, with the goal of increasing its renewable energy capacity to 25% of total electricity generation by 2030 (Balbaa and Abdurashidova, 2023). Additionally, the country is considering the construction of a nuclear power plant as part of its strategy to diversify its energy mix and achieve carbon-neutral energy by mid-21$^{st}$ century (Allaev et al., 2023). In conclusion, Uzbekistan's energy policy encompasses a multifaceted approach, including the development of renewable and nuclear energy, digitalization of the energy sector, and market reforms. The country is focusing on forecasting energy demand, improving energy efficiency, and promoting public awareness of energy-saving practices (Khodjaev, 2012). By implementing these strategies, Uzbekistan aims to significantly reduce its cumulative primary energy consumption and $CO_2$ emissions while preserving energy affordability for

**Table 3: Key factors and strategies for building and maintaining public trust in energy institutions in Uzbekistan**

| Key Factors and Strategies | Description |
|---|---|
| Transparent Decision-Making | Ensure that the decision-making processes in the energy sector are transparent. This includes publishing clear and accessible information on energy policy, tariff changes, and major energy projects. Public access to information about how decisions are made can help reduce corruption and foster trust. |
| Clear Communication of Reforms | Communicate clearly and consistently about policy reforms. The public should understand why these reforms are necessary, what benefits they will bring, and how they will be implemented. This will help mitigate skepticism about privatization efforts, energy price increases, and the environmental impact of the transition. |
| Strong Anti-Corruption Framework | Strengthen anti-corruption measures and ensure that energy institutions operate with high standards of integrity. This includes adopting transparent bidding processes for energy projects, publishing contracts and agreements, and establishing independent oversight bodies to monitor energy-related corruption. |
| Whistleblower Protections | Establish whistleblower protection mechanisms to encourage employees and citizens to report corruption or unethical practices within energy institutions without fear of retaliation. |
| Audits and Transparency Reports | Regularly conduct external audits of energy institutions, and publish annual transparency reports on energy governance, financial expenditures, and project outcomes. This demonstrates a commitment to accountability and transparency. |

households (Gómez et al., 2015). The success of these policies is crucial for Uzbekistan's economic growth, social development, and long-term energy security.

Uzbekistan's energy policy prioritizes the broader public interest through a multifaceted approach that focuses on sustainability, security, and affordability. The country's abundant energy resources present both opportunities and challenges for energy sector development (Gómez et al., 2015). To address these challenges, Uzbekistan is implementing a comprehensive energy policy that includes modernization, diversification, and market-oriented reforms. The government aims to reduce primary energy consumption and $CO_2$ emissions significantly by 2040 while simultaneously improving energy affordability for households (Gómez et al., 2015). This approach balances economic development with environmental concerns and social welfare. Interestingly, despite the need for substantial investments in the power and heat sectors, estimated at $33.6 billion or 1.5% of the country's cumulative GDP between 2010 and 2040, the affordability of energy for households is expected to be preserved or improved (Gómez et al., 2015). This demonstrates a commitment to prioritize public interest while pursuing necessary infrastructure upgrades. In conclusion, Uzbekistan's energy policy focuses on long-term sustainability and security while maintaining affordability for citizens. The country is pursuing a balanced approach that includes modernizing infrastructure, diversifying energy sources, and introducing market-oriented reforms (Allaev et al., 2023). By embracing digitalization, smart grid technologies, and renewable energy sources, Uzbekistan aims to optimize its energy system and improve efficiency (Balbaa and Abdurashidova, 2023). These efforts collectively contribute to broader public interest by ensuring stable, affordable, and environmentally responsible energy for the country (Taghizadeh-Hesary et al., 2020).

Although Uzbekistan has made progress in its economic development since independence, issues of poverty and limited economic opportunities persist (Densmaa and Suren, 2023). This suggests that vulnerable populations may struggle to afford or access electricity reliably. The country's transition from a Soviet-era economy has led to changes in public services and resource allocation, which could impact electricity distribution to disadvantaged groups. Despite these challenges, Uzbekistan has been working to improve access to resources.

Like many developing countries, Uzbekistan faces challenges in providing reliable access to electricity to rural areas. The country's diverse geographic and climatic conditions have led to uneven population distribution, making some remote settlements prone to electricity supply disruptions. These disruptions are often caused by outdated infrastructure and high transmission losses, resulting in system failures during periods of peak power demand. Interestingly, while Uzbekistan is an energy-rich country with significant reserves of gas and other resources, rural areas still struggle with access to electricity. This contradiction highlights the complexities of energy distribution and infrastructure development in developing countries. Some remote villages have resorted to using diesel generators and other fuel alternatives that have a significant environmental footprint. To address these challenges, there is growing interest in renewable energy solutions for rural areas. A study using HOMER software analyzed the economic viability of hybrid wind or solar energy systems compared to diesel-run systems in six selected regions of Uzbekistan. The results suggest that renewables appear to be economically viable, even in fossil-fuel-rich countries such as Uzbekistan. However, the government must synchronize different policy tools to build an efficient, environmentally friendly, and sustainable energy system that can effectively serve rural areas (Djalilova and Esteban, 2018).

### 3.3. Focus Area 3: Civic Engagement and Empowerment

Focus Area 3: Civic Engagement and Empowerment emphasizes the importance of inclusive participation and active support from all stakeholders in the energy transition process. Key actions include fostering effective dialogue with civil society actors, integrating human rights frameworks, and creating inclusive spaces in which citizens' voices are heard. National leadership should recognize the pivotal role of inclusive participation in ensuring a fair transition. Empowering women through sustainable energy access and providing quality, reliable, and understandable information are critical. Institutions must support and empower communities, and the diversity of civil society actors should be acknowledged during policy development (United Nations Development Programme, 2023). Overall, civic engagement is essential for achieving just inclusive and successful energy transitions (Teladia and Van Der Windt, 2023; Sadik-Zada and Gatto, 2022).

Civic engagement and empowerment in energy systems have been explored in various contexts, although coverage of the topic in Uzbekistan and other Central Asian countries remains limited. In Germany, the energy transition has led to diverse forms of civic participation, ranging from community energy initiatives to protests against wind turbines and grid expansion (Radtke et al., 2020). These activities highlight the importance of both bottom-up and top-down approaches in shaping and implementing energy policies. Interestingly, while Uzbekistan's specific energy system is not directly addressed in the literature, the country's cultural and humanitarian cooperation with other Central Asian nations has been noted (Mirzaev, 2021). This cooperation, based on a common history and spiritual values, could potentially extend to energy-related civic engagement. Additionally, the European Union's evolving priorities in Central Asia, including Uzbekistan, have shifted from a focus on energy towards regional cooperation and security issues (Mukasheva and Efe, 2023). In conclusion, while direct information on civic engagement and empowerment in Uzbekistan's energy system is limited, the broader context suggests the potential for development in this area. The experiences of other countries, such as Germany's community energy initiatives, could provide valuable insights for Uzbekistan. Furthermore, existing cultural and humanitarian cooperation among Central Asian countries could serve as a foundation for fostering civic engagement in the energy sector, potentially leading to more empowered

communities and sustainable energy solutions (United Nations Development Programme, 2023).

However, a few limited applications of stakeholder engagement can be found, such as the Stakeholder Engagement Plan (SEP) for the "Improving Energy Efficiency in Social Facilities" project in Uzbekistan. It aims to improve the energy efficiency in public buildings, such as schools, hospitals, and day-care facilities. This project, financed by the World Bank, focuses on energy-efficient retrofitting in public buildings and provides technical assistance to support market development. The SEP outlines a framework for engaging stakeholders throughout the project's life cycle, identifying and analyzing stakeholders, and defining roles for communication and consultation. It also includes grievance mechanisms and strategies for integrating vulnerable groups. This document emphasizes inclusive participation to ensure the successful management of a project's environmental and social risks. Monitoring and reporting are the key aspects of the plan.

Considering the characteristics of local social order, it is necessary to involve multiple stakeholders, particularly at the local level. As proposed in Swarnakar and Singh (2022), a community-centric framework for local governance is a requisite to ensure justice in energy transitions, especially in developing countries of Global South. Similarly, (Fernandez, 2021) highlights the importance of community renewable energy projects but notes that regulatory frameworks often favor large utility companies over community initiatives. Bürer et al. (2022) emphasize the need for smart policies that enable business model transformation and innovation in the energy sector. They state that understanding how to redesign energy governance to allow for business model reconfiguration is crucial for an effective and sustainable energy transition. Taking into account the importance and strength of social ties in Uzbekistan (Urinboyev and Eraliev, 2022), it is essential to involve local stakeholders and communities in the energy transition process, suggesting that current governance structures may be inadequate for fully integrating community participation in sustainable energy initiatives.

### 3.4. Focus Area 4: Appropriate Oversight

Focus Area 4: Appropriate Oversight highlights the importance of effective oversight in the energy transition process, which is inherently complex. To manage the transition, new institutions may need to be established and existing institutions may require expanded responsibilities (United Nations Development Programme, 2023). Strong oversight by relevant agencies is crucial to ensure transparency, accountability, and alignment with sustainability goals. While there is no universal model for oversight, it is essential that these institutions have independent authority to make impartial decisions and manage energy transition effectively (He et al., 2022).

Appropriate Oversight of Energy Transition in Uzbekistan is a critical component for ensuring the success of the country's shift towards a more sustainable and renewable energy system. Given the complexity of the energy transition, appropriate oversight can help Uzbekistan manage and optimize its resources effectively. Some key considerations for oversight in the context of Uzbekistan's energy transition are presented in the Table 4 below.

In summary, appropriate oversight of Uzbekistan''s energy transition should focus on developing a comprehensive policy framework, attracting investment, diversifying energy sources, fostering regional collaboration, and implementing effective monitoring systems. By addressing these areas, Uzbekistan can work towards achieving a sustainable and secure energy future while contributing to global efforts to combat climate change.

**Table 4: Key considerations for oversight in the context of Uzbekistan's energy transition**

| Key considerations | Description |
|---|---|
| Complexity of Energy Transition | The energy transition in Uzbekistan involves multiple sectors such as renewable energy, energy efficiency, and grid modernization. Effective oversight ensures that the transition is managed systemically and coherently, preventing fragmentation and inefficiencies. It also helps in aligning the country's goals with international commitments on climate change and energy security. |
| Establishment of New Institutions or Expansion of Existing Ones | Uzbekistan may need to establish new institutions or restructure existing ones to focus on the management and regulation of energy transition. This includes regulatory bodies that can monitor renewable energy integration, enforce new energy standards, and oversee financing mechanisms for green energy projects. The Ministry of Energy (MoE), which currently plays a central role, might need to expand its responsibilities or collaborate with other entities to address new challenges arising from the transition. |
| Effective Oversight and Role of Relevant Agencies | Oversight agencies, such as the MoE, the Ministry of Finance, and independent regulators, must work together to provide clear guidance, ensure accountability, and track progress. Agencies should oversee compliance with energy laws and regulations, monitor energy production, and evaluate the effectiveness of policies aimed at renewable energy adoption and energy efficiency improvement. |
| Independent Authority for Oversight Institutions | For effective oversight, institutions responsible for the energy transition should be granted independent authority to make decisions free from political or financial pressures. This will enhance trust in the system and ensure that energy policies are implemented impartially and objectively. It will also allow these bodies to enforce regulations, manage public-private partnerships, and address challenges in a flexible, timely manner. |
| Coordinated Oversight for Policy Coherence | Coordination among various ministries, government bodies, and regulatory agencies is crucial for ensuring policy coherence. Oversight should not be isolated but should involve cross-sectoral collaboration to align energy policies with economic, social, and environmental goals. This will ensure that policies are implemented in harmony across sectors and that there is no duplication of efforts or conflicting regulations. |
| Capacity Building for Oversight Bodies | For institutions to effectively carry out oversight, capacity building is essential. This involves training staff in new energy technologies, policy frameworks, and international best practices, ensuring they are equipped to monitor and enforce energy transition policies effectively. |

## 4. CONCLUSION

The UNDP EGF serves as a critical tool for managing energy transitions in countries such as Uzbekistan, where significant reforms are underway to meet the growing energy demands, tackle climate change, and shift toward renewable energy. This framework emphasizes governance principles, such as transparency, accountability, and inclusive participation, which are essential for successful energy transitions.

The potential benefits of applying the UNDP EGF in Uzbekistan may include improved governance and accountability (strengthening transparency and reducing corruption in energy sector management), inclusive energy policies (ensuring policies reflect the needs of all stakeholders, including marginalized groups, promoting equity in energy access), renewable energy investments (a strong regulatory framework fosters a favorable investment climate for sustainable energy projects), and increased public trust (encouraging citizen participation, ensuring that energy policies are understood and supported by the public).

In addition, there are a number of challenges in applying the UNDP EGF in Uzbekistan, such as institutional resistance (existing institutions may resist restructuring or new responsibilities), capacity constraints (limited resources and expertise may hinder the effective implementation of energy governance reforms), political will (successful application depends on the government's commitment to prioritizing and enforcing governance changes), and coordination difficulties (effective coordination across multiple government institutions may be challenging, potentially leading to policy fragmentation).

Further research on energy transition in Uzbekistan implies policy and regulatory frameworks analysis (to establish policies that incentivize investment in renewable energy and energy efficiency), technology integration (carbon capture, utilization, and storage technologies and the development of infrastructure for cross-border trading of renewable energy), social and economic dimensions (to understand the socio-economic impacts of energy transition, particularly in terms of employment and education), renewable energy potential (to explore Uzbekistan's potential for solar and wind energy expansion in light of the current low utilization) (Apergis et al., 2023; Gatto, 2022; Turakulov et al., 2024).

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