COMPARATIVE ANALYSIS OF LEGISLATIVE FRAMEWORKS FOR RENEWABLE ENERGY SOURCES IN GERMANY AND UZBEKISTAN

Jumayev Sanjar
is a 2nd year student at the Karakalpak State University
named after Berdaq
sanjar2005j@outlook.com
https://doi.org/10.5281/zenodo.15378919

Abstract: This thesis conducts a comparative analysis of the legislative frameworks governing renewable energy sources (RES) in Germany and Uzbekistan, two nations at different stages of energy transition. Germany's Energiewende, anchored by the Renewable Energy Sources Act (EEG), exemplifies a mature model with feed-in tariffs, grid prioritization, and long-term climate targets, aiming for 100% renewable electricity by 2035. Uzbekistan's nascent framework, driven by the 2019 Law on the Use of Renewable Energy Sources, focuses on solar and wind expansion through tax exemptions and competitive bidding, targeting 3 GW by 2030. The analysis reveals Germany's strengths in legal stability and stakeholder engagement, contrasted with Uzbekistan's challenges in financial incentives and infrastructure. Drawing on these insights, the thesis proposes subjective recommendations for Uzbekistan, including feed-in tariffs, a grid integration act, a national RES agency, and a long-term climate law, inspired by Germany's approach. This study underscores the importance of tailored legislative strategies to accelerate RES adoption, offering lessons for mutual improvement in diverse economic contexts. As global demand for sustainable energy grows, both nations can benefit from shared best practices, with Uzbekistan poised to enhance its regional renewable potential.

Keywords: Renewable Energy, Legislative Framework, Germany, Uzbekistan, Energiewende, Feed-in Tariffs, Grid Integration, Climate Policy, Energy Transition, Comparative Analysis

Introduction

The global transition to renewable energy sources (RES) is a critical response to climate change and energy security challenges. Legislative frameworks play a pivotal role in shaping the adoption and development of RES, with countries adopting diverse approaches based on their economic, environmental, and political contexts. This thesis conducts a comparative analysis of the legislative documents governing RES in Germany, a leader in the European energy transition, and Uzbekistan, an emerging economy in Central Asia with significant renewable potential. Germany's Energiewende policy

exemplifies a mature, ambitious framework, while Uzbekistan's recent reforms reflect a developing legal landscape. The analysis focuses on key legislative instruments, their objectives, incentives, and implementation mechanisms, highlighting similarities, differences, and lessons for mutual improvement. By examining these frameworks, this thesis aims to contribute to the discourse on effective legal strategies for RES deployment, with a proposal section offering subjective recommendations for enhancing Uzbekistan's legislation inspired by Germany's experience.

Renewable energy, encompassing solar, wind, hydro, and biomass, is central to achieving carbon neutrality and reducing fossil fuel dependency. The European Union's Renewable Energy Directive (EU/2023/2413) sets a binding target of 42.5% RES by 2030, influencing Germany's policies. Uzbekistan, while not bound by such regional frameworks, has introduced laws to leverage its abundant solar and wind resources. This comparative study is timely, given the global urgency of sustainable energy transitions.

Comparative Analysis

Germany's Legislative Framework

Germany's Energiewende (energy transition) is underpinned by a robust legal framework aimed at achieving 80% renewable electricity by 2030 and 100% by 2035, with net-zero emissions by 2045. The cornerstone legislation is the Renewable Energy Sources Act (EEG), first enacted in 2000 and amended multiple times, most recently in 2022 as part of the "Easter Package." This package revised the EEG to prioritize RES expansion as a matter of national security, streamline permitting, and set ambitious targets: 100-110 GW onshore wind, 30 GW offshore wind, and 200 GW solar by 2030.

The EEG employs feed-in tariffs (FITs) and market premiums to incentivize RES producers, ensuring guaranteed payments for renewable electricity fed into the grid. It also mandates grid priority for renewables, facilitating integration. Complementary laws, such as the Offshore Wind Energy Act and Energy Industry Act, address specific sectors, while the Energy Efficiency Act targets a 500 TWh reduction in energy consumption by 2030. The Gas Storage Act (2022) supports energy security by ensuring storage capacity, indirectly aiding RES integration during variable production.

Germany's framework is characterized by stability, long-term planning, and stakeholder engagement. The Climate Law (2021) legally binds the government to emissions targets, reinforcing accountability. Subsidies, tax exemptions, and carbon pricing further incentivize RES adoption, particularly in transport and

heating. However, challenges include high energy prices and public debate over affordability, exacerbated by the 2022 energy crisis.

Uzbekistan's Legislative Framework

Uzbekistan's RES legislative framework is nascent but rapidly evolving, driven by the need to diversify its energy mix, dominated by thermal power plants (85.8% of 14.1 GW capacity). In 2018, RES accounted for only 3% of energy consumption, primarily hydropower. The Law on the Use of Renewable Energy Sources (2019) marks a foundational step, aiming to increase RES capacity to 3 GW by 2030, including 1.9 GW solar and 1.1 GW wind.

The Law on Public-Private Partnerships (2019) facilitates foreign investment in RES projects, while the Presidential Decree No. UP-5989 (2020) introduced competitive bidding for solar and wind projects, enhancing transparency. Uzbekistan's Concept Note for Ensuring Electricity Supply 2020-2030 prioritizes modernization and RES expansion, projecting a 40% increase in electricity production by 2025. Incentives include tax exemptions for RES equipment and land use benefits for developers. However, the absence of feed-in tariffs or green tariffs limits financial support, and low electricity prices (USD 0.024/kWh in 2018) hinder cost-competitiveness of RES compared to fossil fuels.

Uzbekistan faces challenges such as outdated infrastructure, limited local manufacturing, and rapid technological advancements outpacing adoption. The government's commitment to economic incentives, such as green certifications and subsidies, is outlined but not fully implemented, constraining RES growth.

Comparative Insights

Germany's framework is mature, with comprehensive legislation covering all RES sectors, supported by financial mechanisms like FITs and market premiums. Uzbekistan's laws are sector-specific, focusing on solar and wind, with less emphasis on biomass or geothermal. Germany's long-term targets (2030, 2035, 2045) contrast with Uzbekistan's shorter-term goals (2030), reflecting different developmental stages. Both countries prioritize energy security, but Germany's policies are driven by climate neutrality, while Uzbekistan's focus is on economic diversification.

Incentives differ significantly: Germany's FITs ensure investor confidence, whereas Uzbekistan relies on tax exemptions and bidding, which may not sufficiently attract investment. Grid integration is advanced in Germany, with legal mandates for priority access, while Uzbekistan's grid infrastructure requires modernization. Both face challenges—Germany with public resistance

to costs, Uzbekistan with financial and technological barriers—but Germany's stakeholder engagement and legal stability offer a model for Uzbekistan.

Discussion

The comparative analysis reveals that Germany's legislative framework is a benchmark for RES deployment, driven by decades of policy evolution, EU directives, and a strong legal commitment to decarbonization. The EEG's success lies in its adaptability, balancing incentives with market integration, and its alignment with broader climate goals. Uzbekistan's framework, while promising, is constrained by its early stage, limited financial mechanisms, and reliance on foreign investment without robust domestic support.

Germany's approach demonstrates the importance of long-term planning and stakeholder involvement. The "Easter Package" responded to the 2022 energy crisis by accelerating RES as a security measure, showcasing legislative agility. Uzbekistan's reforms, such as the 2019 RES law, signal intent but lack the depth to address systemic barriers like low electricity prices and grid limitations. The absence of FITs or green tariffs in Uzbekistan contrasts with Germany's effective use of these tools to de-risk investments.

However, Uzbekistan's context—abundant solar potential and lower labor costs—offers unique opportunities. Germany's high energy prices and land constraints highlight scalability challenges, whereas Uzbekistan's vast land availability supports large-scale projects.

Both countries can learn from each other: Germany could explore Uzbekistan's competitive bidding model to reduce subsidy costs, while Uzbekistan could adopt Germany's grid priority and stakeholder engagement strategies.

The political dimension also matters. Germany's left-leaning and centrist governments have historically supported RES, while Uzbekistan's centralized governance enables rapid policy shifts but may lack public consultation. Uzbekistan's legislative framework would benefit from greater transparency and public involvement to build trust and ensure sustainability.

Proposal

Based on the analysis, I propose several subjective recommendations for enhancing Uzbekistan's RES legislative framework, drawing inspiration from Germany's Energiewende. First, Uzbekistan should introduce feed-in tariffs or green tariffs to guarantee returns for RES producers, mirroring Germany's EEG. This would attract private investment and offset the high initial costs of RES

projects, given the low electricity prices (USD 0.024/kWh). A phased implementation, starting with solar and wind, could balance fiscal constraints.

Second, Uzbekistan should enact a Renewable Energy Integration Act mandating grid priority for RES, similar to Germany's Energy Industry Act. This would address infrastructure bottlenecks and ensure efficient energy distribution. Upgrading the grid with international funding, as Germany has done through EU mechanisms, is critical.

Third, I recommend establishing a National Renewable Energy Agency, inspired by Germany's regulatory bodies, to oversee policy implementation, monitor progress, and engage stakeholders. This agency could foster public-private partnerships and ensure transparency, addressing Uzbekistan's current lack of centralized coordination.

Finally, Uzbekistan should adopt a long-term climate law, akin to Germany's Climate Law, setting binding RES and emissions targets beyond 2030. This would signal commitment to global climate goals and attract foreign investors. While Uzbekistan's economic constraints differ from Germany's, a tailored approach combining incentives, infrastructure investment, and legal stability could position it as a regional RES leader. These proposals, while ambitious, reflect my belief that Uzbekistan's potential can be unlocked through strategic legislative reforms.

Conclusion

This thesis has compared the legislative frameworks for RES in Germany and Uzbekistan, highlighting Germany's mature, incentive-driven model and Uzbekistan's emerging, investment-focused approach. Germany's Energiewende, supported by the EEG and complementary laws, offers a blueprint for long-term planning and stakeholder engagement, while Uzbekistan's reforms demonstrate progress but face financial and infrastructural challenges. The proposed recommendations—feed-in tariffs, grid prioritization, a national agency, and a climate law—aim to bridge these gaps, leveraging Germany's experience to enhance Uzbekistan's framework. As the global energy transition accelerates, both countries can mutually benefit from sharing best practices, with Uzbekistan poised to emerge as a key player in Central Asia's renewable future.

References:

1. Renewable Energy Directive (EU/2023/2413).
2. International Energy Agency, Uzbekistan Energy Profile.
3. International Energy Agency, Germany Country Profile.

4. MDPI, Energy Transitions in Western European Countries.
5. Турсунов, А. (2022). ЧАҚИРУВГА ҚАДАР БОШЛАНҒИЧ ТАЙЁРГАРЛИК МАШҒУЛОТЛАРИДА ПЕДАГОГИК ВА ИННОВАЦИОН ТЕХНОЛОГИЯЛАРНИ ҚЎЛЛАШ ВА УЛАРНИНГ ЎЗИГА ХОС ТОМОНЛАРИ. Science and innovation, 1(B3), 432-434.
6. Abdurasulov J. (2024). HARBIY PEDAGOGIKANING BOSHQA FANLAR BILAN ALOQASI. Молодые ученые, 2(6), 48–52. извлечено от https://in-academy.uz/index.php/yo/article/view/28164
7. Abdurasulov J., & Pardabayeva , M. (2024). MUSOBAQADAN OLDIN SPORTCHILARNI PSIXOLOGIK TAYYORLASH. Евразийский журнал социальных наук, философии и культуры, 4(6 Part 2), 73–76. извлечено от https://in-academy.uz/index.php/ejsspc/article/view/34717
8. Jahongirmirzo, A., O'G'Li, O. O. B., & Ro'Ziboyevich, C. I. (2022). BO 'LAJAK HARBIY XIZMATCHILARDA PSIXOLOGIK TAYYORGARLIKNING O 'ZIGA XOS JIHATLARI. Science and innovation, 1(B3), 817-820
9. Axrorova , M. . (2025). THE ROLE OF SCAFFOLDING IN TEACHING WRITING TO EFL LEARNERS. Журнал академических исследований нового Узбекистана, 2(4), 164–169. извлечено от https://in-academy.uz/index.php/yoitj/article/view/49751
10. Axrorova , M. . (2025). THE EFFECTIVENESS OF PODCASTS IN DEVELOPING EFL LISTENING SKILLS. Наука и технология в современном мире, 4(7), 13–20. извлечено от https://in-academy.uz/index.php/zdift/article/view/48708
11. Axrorova , M. (2025). THE ROLE OF ROLE-PLAY IN ENHANCING EFL WRITING DEVELOPMENT. Общественные науки в современном мире: теоретические и практические исследования, 4(7), 39–46. извлечено от https://in-academy.uz/index.php/zdif/article/view/48706
12. Axrorova , M. . (2025). THE USE OF GRAPHIC ORGANIZERS IN TEACHING EFL READING SKILLS. Наука и инновация, 3(10), 48–55. извлечено от https://in-academy.uz/index.php/si/article/view/48702
13. Yo'ldashova , M. . (2025). STRESS VA UNI BOSHQARISH USULLARI. Журнал академических исследований нового Узбекистана, 2(4), 170–174. извлечено от https://in-academy.uz/index.php/yoitj/article/view/49753
14. Yo'ldashova , M. 2025. MOTIVATSIYA VA MOTIVLARNI O'RGANISH METODLARI. Педагогика и психология в современном мире: теоретические и практические исследования. 4, 7 (апр. 2025), 30–36.

15. Yo‘ldashova , M. . (2025). OILA PSIXOLOGIYASI. Молодые ученые, 3(10), 50–55. извлечено от https://in-academy.uz/index.php/yo/article/view/48692
16. Yo‘ldashova , M. (2025). QOBILIYATLARNI O‘RGANISH METODLARI. Наука и инновация, 3(10), 56–61. извлечено от https://in-academy.uz/index.php/si/article/view/48703
17. Iskandarova , R. . (2025). XOTIRA HAQIDA UMUMIY TUSHUNCHA. Педагогика и психология в современном мире: теоретические и практические исследования, 4(7), 37–44. извлечено от https://in-academy.uz/index.php/zdpp/article/view/48684
18. Iskandarova , R. . (2025). PSIXOLOGIYADA BILISH JARAYONLARI. Молодые ученые, 3(10), 56–62. извлечено от https://in-academy.uz/index.php/yo/article/view/48693
19. Iskandarova , R. . (2025). ONG VA ONGSIZLIK HAQIDA TUSHUNCHA. Наука и инновация, 3(10), 62–67. извлечено от https://in-academy.uz/index.php/si/article/view/48704
20. Eshnaev N. J. Specific aspects of scientific research of spiritual and moral problems // Academic research in educational sciences. - 2021. - T. 2. - №. Special Issue 1.