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PRIMARY IMPEDIMENTS TO INVESTING IN AZERBAIJAN'S RENEWABLE ENERGY PROJECTS

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ABSTRACT

This article investigates the primary impediments to investing in Azerbaijan's renewable energy sector, highlighting the challenges and opportunities associated with transitioning to sustainable energy sources. Despite Azerbaijan's significant renewable energy potential, particularly in hydroelectric, wind, and solar power, the sector's development is hindered by financial, institutional, regulatory, technical, and informational barriers. The research underscores the limited impact of renewables on the country's energy mix, driven by inadequate policy implementation and fluctuating investment levels. It calls for comprehensive legislative reforms, strategic foreign investments, and the adoption of new technologies to overcome these obstacles. The article also discusses Azerbaijan's efforts to showcase its renewable energy initiatives at COP29, emphasizing the importance of international cooperation in achieving the country's ambitious energy goals. By addressing the identified challenges, Azerbaijan could accelerate its transition to a sustainable energy future, contributing significantly to global climate objectives.
Keywords: Azerbaijan Renewable Energy, Energy Investments, Foreign Investments, Energy Policy, Financial Barriers
JEL codes: O13, Q42, Q48, G38, L98, R58

INTRODUCTION

A significant increase in energy demand is driven by the globe's population growth in an increasingly interconnected society. A study by the International Energy Agency projects that by 2030, there will be a 50% rise in the world's energy consumption. In response to this growing demand, Azerbaijan, like other countries with abundant energy resources, acts aggressively and decisively to improve resource use efficiency. To meet its domestic energy needs, the nation can use both conventional and alternative energy sources, such as gas and oil. However, high-standard energy infrastructure development is urgently needed to effectively harness and utilize alternative energy resources. Even though it ranks 25th in terms of natural gas reserves and is among the top 20 nations with confirmed crude oil reserves, the nation of Azerbaijan is still striving to develop its alternative energy industry. In this regard, Azerbaijan's energy policies seek to guarantee future diversification and effective utilization of both conventional and alternative energy sources, in addition to lowering dependency on conventional energy supplies.

Azerbaijan has been a dependable energy exporter over the last 20 years thanks to the growth of its oil and gas industry. Lately, the expanding demand has brought prospects for expansion and investment in the non-oil industry. Azerbaijan is stepping up its attempts to draw in private and foreign investments in the alternative energy industry by collaborating closely with global energy corporations and financial institutions in order to take advantage of the nation's renewable energy potential.

Azerbaijan, formerly reliant on its enormous oil and gas reserves, is currently going through a significant energy transition centered on sustainability and diversifying its energy mix. The nation has made significant investments in hydroelectric, solar, and wind power to achieve its aggressive targets for raising the proportion of renewable energy in its energy system. Modernizing hydropower plants, building solar power facilities in areas with abundant sunlight, and creating wind farms in the Caspian Sea are important initiatives. Initiatives to improve energy efficiency and integrate smart grid technologies reinforce these efforts even more. This shift intends to strengthen economic resilience while being consistent with Azerbaijan's international environmental goals by lowering its reliance on the export of fossil fuels. The shift to renewable energy is anticipated to advance science, draw in outside capital, and generate new job opportunities. With these projects, Azerbaijan hopes to lead the area in sustainable growth and long-term energy security (*Zero Carbon Analytics*, 2024).

Using renewable energy sources holds great promise for augmenting Azerbaijan's economic diversification and GDP growth across multiple sectors. Azerbaijan's post-2030 vision calls for maintaining a high social security and human development standard while simultaneously creating a strong and competitive economy powered by cutting-edge technologies and an efficient economic framework.

MATERIAL AND METHODS

The main reason for choosing this topic is the urgent issues of energy and climate change. The research seeks to shed light on the obstacles to investing in renewable energy in Azerbaijan. It also provides a detailed analysis of renewable energy statistics and the impact of foreign investments on renewable energy infrastructure. The extensive use of traditional energy sources in current production sectors greatly exacerbates climate change, leading to severe environmental damage and ongoing pollution. Many countries are now working to revise and improve their energy policies to tackle this global issue.

The study relied on desktop research and secondary data collection. Sources included: Official national databases, such as Stat, Azerbaijan's statistical repository; Publications from international organizations like IRENA and the International Energy Agency (IEA); Reports and analyses from private entities and NGOs, including Mordor Intelligence and Zero Carbon Analytics; News articles and official releases from stakeholders like ACWA Power and SOCAR Green LLC. Following references used: Scholarly journals, such as the International Journal of Energy Economics and Policy and Energies, which were utilized for in-depth technical perspectives; Online databases and press releases provided the latest updates on energy projects, partnerships, and policies in Azerbaijan; Historical data on

Azerbaijan's energy production and renewable energy capacities were derived from studies, including Malikov's 2016 presentation at UNECE and IRENA's 2019 Renewable Readiness Assessment.

This qualitative study employed a desktop research methodology to gather insights from a diverse range of secondary data. The process began with defining the research scope to focus on the obstacles to renewable energy adoption and the role of foreign investments in Azerbaijan. Data was systematically collected from official reports, journal articles, and international and local news agencies. Key sources included: Governmental publications: Ministry of Energy of Azerbaijan; International bodies: International Energy Agency, IRENA; News and private sector updates: AzerNews, Climate Change News, Trend News Agency. Information was evaluated for relevance, credibility, and alignment with the research goals, ensuring a comprehensive representation of the renewable energy landscape. The data was then analyzed to identify the challenges and issues facing Azerbaijan's renewable energy sector. The paper will ultimately outline the major obstacles Azerbaijan faces in implementing its renewable energy policies and the role of foreign investments.

RESULTS AND DISCUSSION

Renewable Energy Statistics and Role of Foreign Investments

It is evident that the climatic conditions and characteristics of each country or region significantly influence the utilization of renewable energy. Azerbaijan's favorable geographical location and climatic conditions facilitate the extensive use of environmentally friendly renewable energy sources. By harnessing the country's natural potential to produce electricity and thermal energy from renewable sources, advancements can be achieved in the future development of the electric power industry.

Currently, renewable energy sources have a minimal impact on Azerbaijan's total final energy consumption despite various policies aimed at improving the renewable energy sector. The share of renewables reached 3.1% in 2010 but fell to 1.7% by 2022. One reason for this fluctuation is the change in hydroelectric power production, which was 3,446 million kWh in 2010, but decreased to 1,746 million kWh in 2022. Renewable energy used in non-energy applications has remained low, making up just 0.4% of the total final energy consumption in 2022 (*Mustafayev et al.*, 2022).

According to *Table 1*, Hydropower has traditionally played a significant role in Azerbaijan's energy balance. With a potential of 1,131 MW, hydropower was the most promising renewable energy source in 2017, compared to thermal energy's potential of 6,750 MW. Hydropower resources are located around irrigation canals, the Caspian Sea, the Araz River, the Kura River and its tributaries. The small hydropower sector, including power plants in Sheki, Mugan, Zeykhur, Gusar, Nügadi, Chinarli, Balakan, Guba, and Zurnabad, is thriving alongside independent electricity producers in Azerbaijan. These producers generate electricity for their own use. The addition of the 1.5 MW Balakan Hydropower Plant in 2017 aimed to

increase output in this small hydropower sector. However, hydropower production is affected by seasonal variations (*Ministry of Energy of Azerbaijan*, 2024a).

Table 1. Installed electricity generation capacity, MW, 2022

State electricity producers /autonomous electricity producers /independent electricity producers	Power plants					
	General	Heat	Water	Sun	Wind	Boycott
„Azerenergy" JSC	6 936	5 881	1 055	-	-	-
Nakhchivan State Energy Agency	237	147	68	22	-	-
Self-producers of electricity (BP, SOCAR, Azersun Holding)	722	722	-	-	-	-
„Clean City" OJSC	37	-	-	-	-	37
„Azerishiq" JSC	52	-	-	-	52	-
„Azalternativenerji" LLC	17	-	-	13	3	1
Private wind and hydropower plants	17	-	9	-	8	-
Total, MV	8 017	6 750	1 132	35	62	38
Share, %	100	84.2	14.1	0.4	0.8	0.5

Source: *IRENA*, 2019

Azerbaijan's total power generation capacity is 8320.8 MW, with 1687.8 MW coming from power plants that use renewable energy sources, including large hydropower plants. It represents 20.3% of the overall capacity (*Ministry of Energy of Azerbaijan*, 2024b).

Azerbaijan has excellent wind resources, especially along the Caspian Sea coastline. According to ABOEMDA's investigation, the wind potential is approximately 3,000 MW. Reflecting this potential, the government set a target of obtaining 350 MW of new wind power by 2020. By the end of 2017, 62.4 MW of wind power had been generated, with Azerishiq OJSC contributing 51.7 MW, Azalternativeenergy LLC 2.7 MW, and the private sector 8 MW. Several projects are still under development, including the recently inaugurated Yeni Yashma Wind Power Plant and the Absheron Wind Project (*Malikov*, 2016).

According to *Table 2*, Azerbaijan's solar energy potential is estimated at 23,040 MW, with annual sunshine hours ranging from 2,400 to 3,200. Most of the region experiences global horizontal radiation between 1,387 kW/m² and 1,534 kW/m², while direct normal radiation ranges from 1,095 kW/m² to 1,534 kW/m². There are four solar photovoltaic plants with a capacity greater than one MW, including the 24 MW Nakhchivan Solar Power Plant. Plans include building five 2.8 MW solar power plants and one 4 MW solar power plant. By the end of 2017, 34.6 MW of solar power had been installed nationwide, including installations on the roofs of various public buildings and social enterprises. One such project is the sports complex in Masalli,

which features a 70 kW photovoltaic system owned by Azalternativenerji Public Legal Entity, with financial and administrative processes managed by ABOEMDA (*IRENA*, 2019).

Table 2. Potential of renewable energy sources

Renewable energy sources	Technical Potential, MVT
Wind	3000
Sun	23 040
Bio/Waste	380
Small SES	520

Source: *IRENA*, 2019

Azerbaijan's capacity to produce electricity from garbage and biomass is estimated at 380 MW. Currently, traditional biomass is the primary bioenergy type utilized for cooking and heating in rural regions. Additionally, the Baku Solid Garbage Plant (Block 4) shows the government's efforts to harness the huge potential for energy production from biodegradable household garbage.

The state budget is the primary funding source for Azerbaijan's renewable energy development. According to ABOEMDA, US$579.1 million (987.4 million AZN) was allocated between 2010 and 2022 for various energy sources, including waste, biomass, wind, small hydropower, solar photovoltaics, and heat pumps. The state contributed 480.9 million US dollars (820 million AZN), which accounts for 83% of the total. However, high interest rates have made lending for renewable energy and energy efficiency projects less attractive. The Central Bank of Azerbaijan increased the interest rate from 4% at the beginning of 2019 to 14% by the end of the year.

The European Investment Bank (EIB) has been working with Azerbaijan since 2014, operating within the framework of the European Neighbourhood Policy, the Eastern Partnership, and other EU agreements. The EIB has invested over €96 million in Azerbaijan, including €25 million in funding for more than 120 local businesses through partnerships with local banks. The EIB supports Azerbaijan's efforts to diversify its economy, with a focus on renewable energy, energy efficiency, and promoting balanced economic development, particularly in rural areas. These efforts are part of the EU4Business initiative and are aimed at strengthening growth, healthcare, digitalisation, and climate action, especially in light of the COVID-19 pandemic (*European Investment Bank*, 2024).

As per the executive agreement between Azerbaijan's Ministry of Energy and Saudi Arabia's ACWA Power, the foundation for the 240 MW Khizi-Absheron Wind Power Plant was laid on January 13, 2022, with an investment of $300 million. The President of Azerbaijan has set a goal to increase the share of renewable energy sources in the country's total energy capacity to 30% by 2030 (*ACWA Power*, 2020). A report by the German company VPC indicates that to meet this target, Azerbaijan needs to install new renewable energy plants with a total capacity of 1,500 MW by 2030. This includes 440 MW to be added between 2020 and 2022, 460 MW between 2023 and 2025, and 600 MW between 2026 and 2030, all in three phases (*International*

Energy Agency, 2021). Preliminary research across 16 regions identified 20 potential sites for solar power plants, covering a total area of 9,218 hectares and providing a capacity of 4,609 MW. Power generation from these sites is projected to be 6.1 billion kWh (*International Energy Agency*, 2021).

With a massive 240 MW wind farm project that is expected to produce one billion kilowatt-hours annually, ACWA Power has had a significant impact on Azerbaijan's renewable energy market. This program demonstrates ACWA Power's dedication to supporting the nation's infrastructure for sustainable energy. (*ACWA Power*, 2023)

The administration of President Ilham Aliyev has formally approved an investment deal, confirming ACWA Power's contribution to the advancement of renewable energy technology in Azerbaijan. The company is working with prestigious partners – Masdar and SOCAR – to construct 500 MW of renewable energy capacity. A significant portion of this capacity – 286 million – will go toward the company's continuing 240 MW wind power project.

These expenditures demonstrate ACWA Power's steadfast commitment to renewable energy initiatives in Azerbaijan and its vital role in furthering the country's sustainable development objectives. ACWA Power maintains its position as a major participant in the sustainable development initiatives of the region and shapes the renewable energy landscape of Azerbaijan through its strategic collaborations and investments (*Abdul*, 2024).

Azerbaijan has launched its first renewable energy auction for a 100 MW solar plant in Garadagh, as part of its effort to boost renewable energy capacity to at least 30% of its total electricity generation by 2030. The Ministry of Energy, with support from the European Bank for Reconstruction and Development (EBRD), has made the application process available on its website. Interested developers can request qualification documentation starting April 30, with submissions due by June 14. The auction aligns with Azerbaijan's green energy goals, encouraging private investment in large-scale renewable projects. The EBRD has helped shape the country's renewable energy framework, contributing to new laws and facilitating competitive procurement. The EBRD has also played a key role in financing key green energy projects, such as the first solar plant in Garadagh and a major wind farm in Absheron and Khizi (*Bitsadze*, 2024).

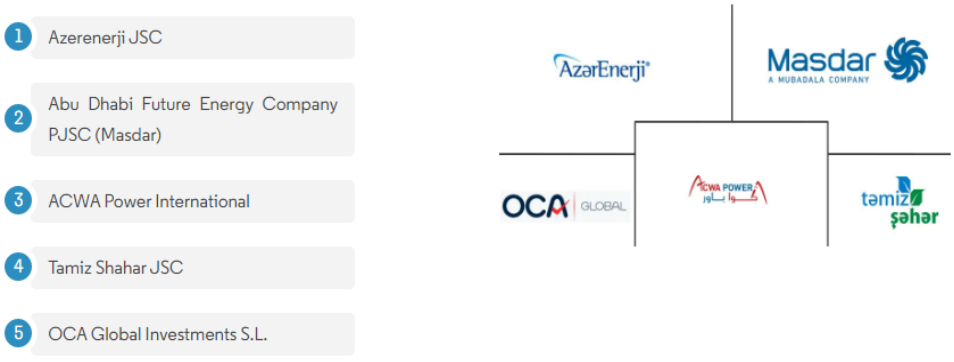
BP and Nobel Energy have significantly invested in Azerbaijan's renewable energy sector through various initiatives. BP, in collaboration with the Azerbaijani Ministry of Education, has funded $2 million to establish a new master's program in renewable energy at a local institution (*BP*, 2021). Meanwhile, Nobel Energy is advancing a 100 MW solar power station in Jabrayil, which is expected to reduce carbon emissions by 1,170,000 tons over 25 years. Additionally, the company has signed a deal with the Ministry of Energy to develop 400 MW of solar power plants in Nakhchivan (*Nobel Energy*, 2018).

Global energy companies are increasingly relying on renewable energy sources to cut carbon emissions and combat climate change. For this transformation to be effective, large investments must be made in technologies including carbon capture, hydroelectric power, solar, wind, and green hydrogen generation. These projects not only follow environmental regulations, but also aim to establish the benchmark for a more sustainable and dependable energy future.

In the area of renewable energy, SOCAR has made significant strides lately. Approved by the SOCAR Supervisory Board, SOCAR Green LLC is a company entrusted with overseeing renewable energy initiatives and forging partnerships with international organizations. Part of SOCAR Green LLC's mission is to decarbonize the production of oil and gas through initiatives including carbon capture and storage and green hydrogen generation. Additionally, it is developing strategic plans tailored to Azerbaijan's requirements in order to use global best practices and reduce the country's carbon emissions (*Zeynalova*, 2023).

The *Figure 1* indicates the top renewable energy companies which play a great role in implementation of renewable energy projects. A new facility will be built in Azerbaijan in partnership with Baker Hughes, as it has been announced by SOCAR. Current agreements with important partners like Energy China, Masdar, and BP are driving major initiatives. Examples of these projects include a 1 GW wind and solar project with Masdar and a 240-MW solar facility in Jabrayil with BP. With partners like Masdar and ACWA Power, future plans call for extending renewable energy programs in the Nakhichevan Autonomous Republic. Furthermore, an electric submersible pump (ESP) assembly and repair facility has been developed in Azerbaijan by SOCAR and Baker Hughes. With the help of SOCAR's Azneft Production Union and Baker Hughes Services International, this partnership will first supply 50 ESP kits to Azerbaijan with the goal of improving production efficiency through cutting-edge technology and strategic cooperation (*Yevgrashina*, 2024).

Figure 1. Azerbaijan Renewable Energy Top Companies



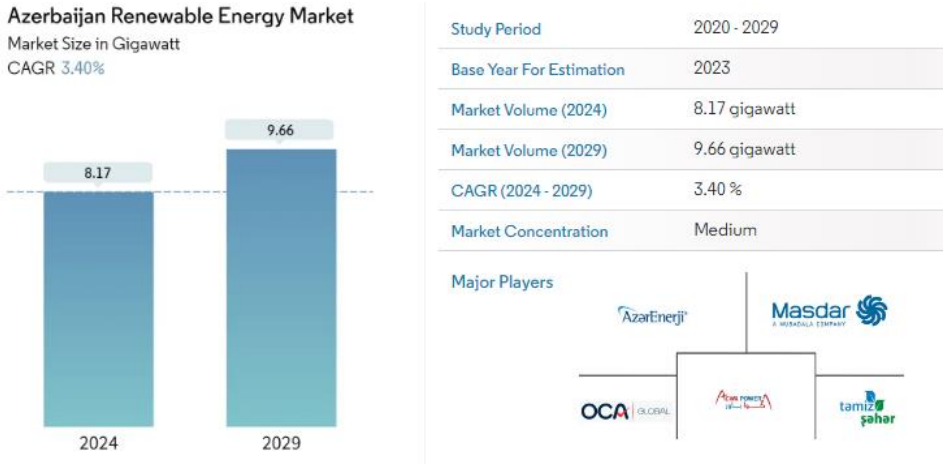
Source: *Mordor Intelligence*, 2024

Smart cities and villages represent a major step forward in Azerbaijan's energy transition endeavors. Aghali is a unique „smart village" in southern Azerbaijan that represents the government's attempts to rebuild the Karabakh region after the 2020 conflict (*Civillini*, 2024). Aghali is a center for renewable energy with innovative „smart agriculture" initiatives, a state-of-the-art hydropower facility, and residential solar panels—all working toward „net zero" emissions. Aghali is the prototype for future smart village developments in Karabakh, the first of about thirty planned smart villages. Eastern Zangezur and Karabakh have been named „green energy zones" by

the administration, which also intends to build a 500 MW solar power plant in Nakhchivan, among other renewable energy initiatives (*Azertag*, 2024a).

The *Figure 2* shows that the Azerbaijani renewable energy market is anticipated to reach 9.66 gigawatts by 2029, growing at a compound annual growth rate (CAGR) of 3.40% from its predicted 8.17 gigawatt capacity in 2024. The COVID-19 epidemic caused delays in both ongoing and planned projects, negatively impacting the market. However, it has since returned to pre-pandemic levels.

Figure 2. Renewable Energy in Azerbaijan Market Size



Source: *Mordor Intelligence*, 2024

As stated in the nation's Strategic Road Map on National Economic Perspectives, attempts to diversify the economy and lessen dependency on the oil and gas sector are major drivers of the renewable energy market in Azerbaijan. Furthermore, diversifying the energy mix is anticipated to positively impact the market by creating jobs and improving energy security, among other things.

However, delays in the actual execution of projects and inadequate investment from foreign businesses could impede the market's expansion. Currently, the oil industry makes up one-third of Azerbaijan's GDP, with crude oil exports being a major contributor. In the upcoming years, the nation hopes to cut back on domestic gas and oil usage in order to raise more money. This change will probably result in a higher proportion of renewable energy in the energy mix, which will open up new opportunities for market players in the near future (*Mordor Intelligence*, 2024).

In November 2024, Baku, Azerbaijan, will host the 29th Conference of the Parties (COP29) to the United Nations Framework Convention on Climate Change (UNFCCC). Azerbaijan is making extensive preparations to host what is anticipated to be the most inclusive COP yet. Azerbaijan has been collaborating closely with several international organizations, such as the International Islamic Educational, Scientific, and Cultural Organization (ISESCO), to guarantee a successful event and improve cooperation. (*Azertag*, 2024b).

Azerbaijan has a fantastic chance to showcase its renewable energy capabilities and green energy export initiatives by hosting COP29 in November 2024. The Caspian-Black Sea-European Green Energy Corridor project is expected to be a major talking point at the summit, highlighting Azerbaijan's commitment to energy security and international climate cooperation. The nation's goals of advancing its energy transition and assisting Europe's decarbonization efforts are congruent with its aspirations for green energy exports, especially through this corridor. Azerbaijan will be able to present its goals for green energy exports and its leadership in renewable energy to a global audience during the summit.

Azerbaijan, the host of COP29 in November, has revealed plans to boost the proportion of renewables in its energy sector to nearly one-third. The country aims to invest $2 billion in green energy, with Energy Minister Parviz Shahbazov stating that by 2027, Azerbaijan will add around 2GW of renewable energy, increasing the renewable share in installed capacity to 33%. Currently, renewables account for 20.86% of the energy mix. Despite the global decline in fossil fuel investments and uncertainty around long-term demand, Shahbazov emphasized Azerbaijan's continued commitment to supplying natural gas to its partners (*World Economic Forum*, 2024).

Major challenges for Renewable energy investments

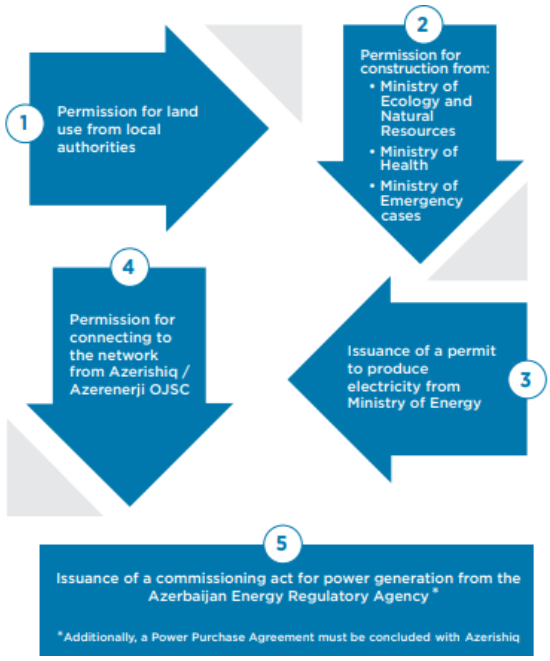
Even while interest in renewable energy is growing, Azerbaijan still has trouble making the most of its plentiful resources. The four main challenges facing the government are informational, institutional/regulatory, technical, and financial. The legal concerns surrounding the generation and usage of renewable energy present the first obstacle. The government is currently drafting legislation to regulate this industry. Furthermore, debates on the relevant bill are still ongoing. Sustainable investments in renewable energy must be undertaken, mainly by the government and international organizations. Moreover, it is believed that the current—technical, legal, and regulatory—infrastructures are insufficient to promote a favorable business climate in the renewable energy industry. These circumstances impede efficiency by making it difficult for private companies to invest. (*Hamidova et al.* 2022).

The legal and regulatory framework has evolved to drive a more competitive power market. *Figure 3* denotes existing renewable energy permitting procedure including permission for land use from local authorities, permission for construction from Ministry of Ecology and Natural Resources, Ministry of Health and Ministry of Emergency Cases, Issuance of a permit to produce electricity from Ministry of Energy, permission for connecting to the network from Azerishiq/Azerenerji OJSC and Issuance of commissioning act for power generation from the Azerbaijan Energy Regulatory Agency.

Since the technologies needed for renewable energy are expensive investments, Azerbaijan is confronted with technical challenges in transferring technology. This presents a second challenge. Technical procedures must be made simpler because Azerbaijan buys these technologies from elsewhere. Oil and natural gas have long dominated the nation's electricity industry, which has led to a higher level of knowledge in conventional energy technologies than in renewable ones. The absence

of funds and excessive loan rates, which provide serious difficulties, make up the third barrier. The economy of Azerbaijan has been severely impacted by the decline in oil prices since mid-2014. The lack of knowledge in the renewable energy industry is the fourth main problem, as local and international organizations need to do more to promote RES education. (*Hamidova et al.* 2022).

Figure 3. Overview of existing renewable energy permitting procedures



Source: *IRENA*, 2019

Therefore, regardless of the ambitious actions the Azerbaijani government might commit to or initiate at this year's COP29, certain issues in Azerbaijan's energy consumption pose a risk to achieving positive outcomes. These issues include:

The corporate climate in the nation is generally unfavorable to the advancement of energy efficiency. Up until now, the main goal of the non-oil sectors has been to create jobs. Energy and economic efficiency have come in second. However, ineffective economic activity does not produce income. Moreover, it makes more expenditures in the national budget necessary. As a result, Azerbaijan has made energy efficiency its main priority in the country's post-oil period, developing RES. Since the public sector now controls the majority of the nation's energy market, the private sector needs to play a more significant role in it. Except for businesses engaged in the production and distribution of electricity, all state-owned businesses ought to be considered for possible privatization. Concurrently, a primary goal for the private sector should be to support the expansion of renewable energy companies. The existing governance structure in the energy sector is largely a holdover from the Soviet era, with only minor adjustments. This outdated governance approach conflicts with the government's

decarbonization priorities, and not enough measures are taken to meet its obligation in line with Paris Agreement The average Azerbaijani has uneconomical energy use behavior. The government needs to refocus its efforts on promoting more economical consumer behavior, even though it has historically seen energy consumption as a producer-centric activity (*Ahmadov*, 2024).

CONCLUSION

At this critical juncture in its energy evolution, Azerbaijan's renewable energy sector has room to grow significantly. The nation's wealth of hydroelectric, wind, and solar energy resources offers significant prospects for the advancement of green energy. Nonetheless, reaching the lofty goals the Azerbaijani government has set, will be challenging.

This report identifies the main obstacles to increase investment in Azerbaijan's renewable energy sector. These consist of financial obstacles, institutional and legal restrictions, informational gaps, and technical limitations. These obstacles hamper the quick deployment and expansion of renewable energy infrastructure, even with Azerbaijan's favorable climate and the continued efforts of foreign companies like BP, Nobel Energy, and ACWA Power.

The results emphasize that extensive legislative changes and calculated investments are required to fully utilize Azerbaijan's renewable resources. Encouraging investments in renewable energy requires improvements in financial incentives, adoption of new technologies, and regulatory frameworks. Furthermore, the advancement of Azerbaijan's energy transition and the removal of current obstacles will depend on foreign investments and collaborations.

Azerbaijan is poised to host COP29, and the international spotlight presents a special chance to highlight its achievements and goals in the field of renewable energy. Through tackling the recognized obstacles and harnessing global assistance, Azerbaijan may expedite its shift towards a sustainable energy future and make a substantial contribution to the worldwide climate objectives.

The path ahead is difficult, but by focusing its efforts and collaborating strategically, Azerbaijan can accomplish its goals in renewable energy and create a model for other countries in the area.

REFERENCES

Abdul (2024). *Acwa Power's Abid Malik plans $5B investment in Azerbaijan*. AzerNews. https://www.azernews.az/business/227064.html

ACWA Power (2020). *Under the Patronage of the Saudi Minister of Energy, ACWA Power Signs Three Agreements for the First Foreign Investment Based Independent Wind Power Project in Azerbaijan*. https://www.acwapower.com/news/under-the-patronage-of-the-saudi-minister-of-energy--acwa-power-signs-three-agreements-for-the-first-foreign-investment-based-independent-wind-power-project-in-azerbaijan/#

ACWA Power (2023). *Acwa Power Expands Presence in Azerbaijan Through Key Renewable Energy Partnerships.* https://www.acwapower.com/news/acwa-power-expands-presence-in-azerbaijan-through-key-renewable-energy-partnerships/

Ahmadov (2024). *Green Economy and Energy Efficiency Challenges Facing Azerbaijan*. Baku Research Institute. https://bakuresearchinstitute.org/en/green-economy-and-energy-efficiency-challenges-facing-azerbaijan/

Azertag (2024a). *Azerbaijan is a regional leader in green energy transition*. https://azertag.az/en/xeber/azerbaijan_is_a_regional_leader_in_green_energy_transition-2882830

Azertag (2024b). *Azerbaijan, ICESCO discuss prospects for expanding cooperation*. https://azertag.az/en/xeber/azerbaijan_icesco_discuss_prospects_for_expanding_cooperation-2903635

BP (2021). *A new renewable energy programme for Azerbaijan's university*. https://www.bp.com/en_az/azerbaijan/home/news/press-releases/A-new-renewable-energy-programme-for-Azerbaijans-university.html.

Bitsadze (2024). *Azerbaijan launches first renewables auction*. European Bank for Reconstruction and Development. https://www.ebrd.com/news/2024/azerbaijan-launches-first-renewables-auction.html

Civillini (2024). *In Nagorno-Karabakh, Azerbaijan's net zero vision clashes with legacy of war*. Climate Home News. https://www.climatechangenews.com/2024/05/15/in-nagorno-karabakh-azerbaijans-net-zero-vision-clashes-with-legacy-of-war/

European Investment Bank (2024). Azerbaijan and the EIB. https://www.eib.org/en/projects/country/azerbaijan#3102156504638607555

International Energy Agency (2021). *Azerbaijan 2021 Energy Policy Review*. https://iea.blob.core.windows.net/assets/49662c46-575f-4561-a541-5541f5342b07/Azerbaijan2021EnergyPolicyReview.pdf

IRENA (2019). *Renewable Readiness Assessment Republic of Azerbaijan*. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Dec/IRENA_RRA_Azerbaijan_2019.PDF

Hamidova, L., Huseynov, A., & Samedova, E. (2022). Challenges in Implementing Renewable Energy Sources in Azerbaijan. *International Journal of Energy Economics and Policy*, 12(6), 441–446. https://doi.org/10.32479/ijeep.13636

Malikov (2016). Opportunities and challenges for the development of renewable energy sources in Azerbaijan. [Conference presentation]. 7th International Forum on Energy for Sustainable Development 18 - 21 October 2016. Baku, Azerbaijan. https://unece.org/fileadmin/DAM/energy/se/pp/eneff/7th_IFESD_Baku_Oct.2016/8_path/Malikov_Azerbaijan.pdf

Ministry of Energy of Azerbaijan (2024a). *List of power plants and independent energy producers of the electric power system of Azerbaijan*. https://minenergy.gov.az/en/elektroenergetika/azerbaycan-energetika-sisteminde-ve-musteqil-fealiyyet-gosteren-elektrik-stansiyalarinin-siyahisi

Ministry of Energy of Azerbaijan (2024b). *The Use of Renewable Energy Resources in Azerbaijan*. https://minenergy.gov.az/en/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade

Mordor Intelligence (2024). *Azerbaijan Renewable Energy Companies*. https://www.mordorintelligence.com/industry-reports/azerbaijan-renewable-energy-market/companies

Mustafayev, F., Kulawczuk, P., & Orobello, C. (2022). Renewable Energy Status in Azerbaijan: Solar and Wind Potentials for Future Development. *Energies*, *15*(2), 401. https://doi.org/10.3390/en15020401

Nobel Energy (2018). *Global Energy Solutions starts its next project for BP Azerbaijan*. https://nobelenergy.com/media/news/global-energy-solutions-starts-its-next-project-for-bp-azerbaijan-48

World Economic Forum (2024). *Azerbaijan announces green investment push ahead of COP29 - plus other top energy stories.* https://www.weforum.org/stories/2024/06/energy-news-azerbaijan-green-investment/

Yevgrashina (2024). *Azerbaijani SOCAR, Baker Hughes to establish ESP assembly*. Trend news agency. https://en.trend.az/business/energy/3912281.html

Zero Carbon Analytics (2024). *Azerbaijan's energy and climate policies dominated by gas export expansion plans*. https://zerocarbon-analytics.org/archives/energy/azerbaijans-climate-policies-dominated-by-gas-export-expansion-plans

Zeynalova (2023). *Key goals of SOCAR Green LLC revealed*. Trend news agency. https://en.trend.az/business/energy/3843475.html

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