



BEYOND OIL: AZERBAIJAN'S CLIMATE ACTION IN PRACTICE AND ITS EMERGING LOW-CARBON PATH

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Abstract. This article examines how Azerbaijan is reducing greenhouse gas emissions through international climate commitments, domestic legal reforms, and implementation-focused institutions. It highlights renewable energy deployment, energy efficiency measures, methane-reduction alignment, and the “Green Energy Zone” initiative, alongside the catalytic role of COP29 in Baku in strengthening climate finance and cooperation for measurable mitigation progress.

Keywords: Climate governance, climate mitigation, green growth strategy, renewable energy, climate finance, GHGs, COP29, Paris Agreement.

Introduction

Azerbaijan is often discussed through the lens of oil and gas, yet its climate policy story is increasingly defined by a different question: how a hydrocarbon economy can build credible, implementation-focused mitigation through laws, institutions, investment frameworks, and deliverable projects. This question became especially visible when Azerbaijan hosted the UN Climate Change Conference COP29 in Baku in November 2024 [18], placing the country at the center of international debates on climate finance and delivery.

Climate governance research emphasizes that mitigation outcomes depend not only on ambition, but also on the institutional capacity to design, finance, and implement policy instruments over time. In this respect, Azerbaijan represents a relevant case for examining how an energy-exporting state can build a transition narrative while maintaining economic stability and addressing development priorities. The country's climate approach can be understood as an evolving framework that connects treaty participation and target-setting with domestic legal reforms and sectoral delivery mechanisms. Recent policy developments [17] suggest a stronger emphasis on renewable electricity deployment, energy efficiency, and complementary measures aimed at reducing high-impact emissions sources such as methane. At the same time, the strategic positioning of Azerbaijan as a regional energy hub creates incentives to modernize the energy system and diversify toward low-carbon technologies and infrastructure. From an analytical perspective, focusing on verifiable actions—laws, institutions, financing instruments, and commissioned projects—helps distinguish implementation from aspiration. Accordingly, this article evaluates Azerbaijan's mitigation trajectory by tracing how commitments are translated into governance arrangements and investment decisions that can support measurable

emissions reductions.

This article takes a practical approach. Instead of evaluating climate action mainly through political statements, it tracks measurable “proof points”: treaty participation; nationally stated targets; enacted laws; the creation of specialized agencies and funding tools; and commissioned renewable energy projects. The aim is not to claim that every challenge has been solved, but to show-based on verifiable public evidence-what Azerbaijan is doing and how these measures are structured to reduce greenhouse gas emissions over time.

Objective

This article’s objective is to provide a clear, evidence-based explanation of what Azerbaijan is doing to reduce greenhouse gas (GHG) emissions, and how these actions are organized through law, institutions, and major projects.

Research Question

How is Azerbaijan reducing GHG emissions in practice, and which policies, projects, and international commitments provide evidence of measurable progress?

To achieve this purpose, the research addresses the following questions

1. Which international climate agreements and national commitments shape Azerbaijan’s mitigation direction?
2. Which domestic laws, agencies, and financing mechanisms enable implementation?
3. Which major projects and policy initiatives provide verifiable evidence of delivery (renewables, efficiency and methane?).
4. How do recent developments (including COP29) reinforce implementation through finance and international mechanisms?

Methodology

This article uses implementation-focused policy analysis methodology to examine how Azerbaijan is reducing GHG emissions through legal reforms, institutional design, and project delivery. This approach allows for a direct, evidence-based assessment of Azerbaijan’s mitigation pathway by tracing how international commitments are translated into domestic policies and measurable actions.

This study adopts a mixed-methods desk-research approach, integrating (1) qualitative analysis of secondary sources-such as peer-reviewed academic literature, national policy and legal documents, the United Nations Framework Convention on Climate Change (UNFCCC) submissions, and official institutional publications-with (2) a descriptive quantitative component based on publicly reported figures (e.g., treaty dates, NDC targets, sectoral emission shares, project capacities, and implementation milestones). This design is well suited for

understanding climate action as a governance process because it enables both a detailed interpretation of policy mechanisms and a factual mapping of verifiable implementation evidence.

Data was collected from a wide range of credible secondary sources. These include UNFCCC party records and submissions (Kyoto/Paris participation, NDCs, and transparency reporting), national legal and institutional materials (renewables and energy-efficiency laws, agency mandates, official decrees and program descriptions), and project-level documentation from responsible institutions and developers (renewable-energy commissioning and investment announcements). These sources provide a comprehensive picture of the policy environment and implementation context, allowing the study to connect climate commitments with governance arrangements and concrete delivery instruments.

The key criteria of my analysis are (1) legal commitment and policy alignment, (2) institutional capacity and implementation architecture, (3) investment and delivery mechanisms, (4) transparency and reporting, and (5) mitigation relevance (i.e., the extent to which an action plausibly contributes to emissions reduction through renewables, efficiency, methane abatement, or related measures). These criteria make it possible to evaluate the coherence of Azerbaijan's mitigation strategy without relying on speculation or unsupported claims.

By assessing these criteria across the evidence base, I was able to identify the main components of Azerbaijan's mitigation model and explain how they function together. Ethical considerations were addressed by ensuring proper citation and using only verifiable sources; all factual claims are tied to official records or reputable publications. A limitation of the study is its reliance on secondary sources, which may reflect differences in reporting standards or institutional perspectives. To strengthen validity, I cross-referenced multiple high-credibility sources (e.g., UNFCCC records alongside national legal texts and international assessments), which enhances reliability and reduces the risk of bias from any single document.

This methodology enables a clear evaluation of Azerbaijan's climate action as an implementation process, providing an academically grounded understanding of how the country is pursuing GHG mitigation through governance reforms and project-based delivery within the Paris Agreement framework.

Findings and Discussions

International commitments and the national mitigation direction: Azerbaijan's mitigation trajectory is shaped primarily by its participation in the global climate regime under the United Nations Framework Convention on Climate Change [21]. Through this framework,

Azerbaijan developed national capacities for GHG reporting, inventory preparation, and climate policy coordination. Engagement under the Convention established the institutional foundations that continue to support the country's evolving mitigation policies. According to the UNFCCC party record, Azerbaijan ratified the Kyoto Protocol on 28 September 2000 [22] and later signed the Paris Agreement on 22 April 2016 [20], ratifying it on 9 January 2017.

Experience under the Kyoto Protocol influenced Azerbaijan's mitigation approach, particularly through exposure to flexible mechanisms and emissions accounting practices. Participation during this period contributed to the development of domestic expertise in emissions monitoring and inventory management, which subsequently informed the design of Paris-era commitments.

The Paris Agreement now provides the central framework guiding Azerbaijan's mitigation direction. Under the Agreement, Parties communicate and update Nationally Determined Contributions (NDCs) [19], are expected to strengthen ambition over time, and report progress through agreed transparency mechanisms. Azerbaijan's mitigation priorities are therefore most clearly articulated through its submitted NDC documents and associated reporting, which define national targets relative to a historical baseline and link implementation to available domestic capacity and international cooperation.

External policy tracking initiatives, including EU4Climate, summarizes Azerbaijan's first NDC (2015) commitment as a 35% greenhouse-gas reduction by 2030 compared to 1990 [6]. More recent submissions place greater emphasis on the long-term trajectory. Azerbaijan's Second NDC (submitted in 2023) outlines a conditional target of a 40% reduction by 2050 compared to 1990, explicitly linked to enhanced international support in areas such as climate finance and technology transfer [23]. This conditional framing is consistent with established practice under the Paris Agreement, signaling ambition while recognizing the role of international cooperation in determining the pace and scale of implementation.

Academic research further complements this by modelling pathways to meet Azerbaijan's Paris-related commitments. For example, T.B.Felver [8] applies scenario modelling to examine how Azerbaijan could reach its mitigation goals through policy measures (including an EU-policy-style scenario), illustrating the role of structured policy packages rather than single instruments.

Domestic enabling framework: laws, agencies, and financing tools: Mitigation requires legal certainty and institutional capacity to attract investment and coordinate implementation. Azerbaijan's Ministry of Energy lists two major enacted laws that form the backbone of its clean-energy governance:

- **Law No. 339-VIQ (31 May 2021)** [13] on the use of renewable energy sources in electricity generation; and
- **Law No. 359-VIQ (9 July 2021)** [4] on efficient use of energy resources and energy efficiency.

These laws are widely recognized in comparative climate-law tracking as the core legal framework for renewables and efficiency in Azerbaijan.

Institutionally, the Azerbaijan Renewable Energy Agency (AREA) is a central implementation actor. AREA publicly states a strategic objective of increasing the share of renewables in installed generation capacity to 30% by 2030, aligning national planning with a measurable benchmark [1].

On the financing side, Azerbaijan established an Energy Efficiency Fund (EEF) by presidential decree dated 1 March 2024, explicitly intended to stimulate and promote energy efficiency measures [15]. International energy policy analysis also notes this fund as part of the institutional toolkit supporting efficiency deployment [7].

Scholarly and policy literature consistently emphasizes that legal clarity, institutional coordination, and targeted financing mechanisms function as decisive enablers of energy transition [9]. In the case of Azerbaijan, this insight is particularly relevant given the country's historically centralized energy sector and oil-based growth model [16]. International assessments by the Organisation for Economic Co-operation and Development and the International Renewable Energy Agency highlight that recent governance reforms and improvements in investment readiness are critical for scaling renewable energy deployment and strengthening energy-efficiency outcomes in Azerbaijan [14].

Delivery through renewable energy: flagship projects and scaling signals: A practical indicator of mitigation delivery is the commissioning of utility-scale renewable projects with quantified outputs, alongside a credible pipeline of follow-on investments. Azerbaijan's most visible commissioned flagship is the 230 MW Garadagh Solar PV Plant, officially inaugurated on 26 October 2023 [18]. The Ministry of Energy reports expected annual generation of about 500 million kWh, with associated savings of 110 million cubic meters of natural gas and an estimated reduction of around 200,000 tonnes of CO₂ emissions per year; the project is described as covering roughly 550 hectares, comprising about 570,000 solar panels, and connected via a 330 kV substation [12].

Project documentation published by Masdar (2023) confirms that the Garadagh Solar PV Plant was developed under a public-private partnership structure with a long-term power-purchase agreement, illustrating Azerbaijan's use of international investment mechanisms to

support renewable energy deployment [11].

Beyond this commissioned flagship, scaling signals are evident in Azerbaijan's formally articulated policy targets and confirmed project pipeline. Azerbaijan's objective for renewable energy sources to account for around 30% of installed electricity generation capacity by 2030 is stated in national energy policy materials and referenced in international policy tracking exercise [3].

Wind energy development complements this trajectory. The Khizi–Absheron onshore wind power project, with a planned capacity of 240 MW, is documented by the European Bank for Reconstruction and Development (EBRD) as a major renewable investment under implementation in Azerbaijan [5]. EBRD project appraisal materials estimate substantial annual emissions-reduction potential once the facility becomes operational, reinforcing the role of wind power alongside solar energy in Azerbaijan's medium-term mitigation pathway.

Taken together, the commissioning of the Garadagh Solar PV Plant, the advancement of large-scale solar projects to the financing stage, and the documented development of utility-scale wind capacity provide verifiable, project-level evidence of mitigation delivery through renewable energy in Azerbaijan.

Moreover, Azerbaijan also has institutionalized decarbonization through the “Green Energy Zone” initiative in the liberated territories, established by Presidential Order No. 2620 of 3 May 2021 [24], with a concept developed by the AREA in cooperation with Japan's TEPCO [2], which conducted renewable-energy potential assessments and power-and-transmission planning linked to a master plan.

Methane action as a high-impact climate lever: Methane reduction is increasingly prioritized internationally, and Azerbaijan formally joined the Global Methane Pledge in 2024, as listed in the official ministerial factsheet of the pledge [10]. By joining, Azerbaijan associated itself with the collective objective of reducing global methane emissions by at least 30% by 2030 compared to 2020 levels, without adopting a binding national methane target. International inventories identify oil and gas production and processing as the main sources of methane emissions in Azerbaijan. Azerbaijan participates in the World Bank's Global Gas Flaring Reduction Partnership, and World Bank data show a substantial decline in routine gas flaring since the early 2000s, which is directly relevant to methane mitigation. Methane-related mitigation is referenced indirectly in Azerbaijan's Second Nationally Determined Contribution through commitments to reduce energy losses and improve efficiency in the energy sector.

COP29 in Baku: diplomacy, finance, and implementation framing: Hosting COP29 mattered for Azerbaijan's climate action in two interrelated ways: it enhanced the country's

international visibility within global climate governance and linked its domestic transition narrative more directly to the global implementation agenda, particularly climate finance and cooperative mechanisms. According to official coverage by the United Nations Framework Convention on Climate Change, COP29 concluded in Baku with the adoption of a new global climate finance goal aimed at supporting mitigation and adaptation while enabling clean-energy-driven economic growth. The World Meteorological Organization further summarizes the outcome as including a collective commitment to mobilize **at least USD 300 billion annually** [25] to support climate action in developing countries. Complementing this, a policy briefing by the European Parliament highlights that COP29 not only adopted the new finance goal but also finalized the rules for operationalizing Article 6 of the Paris Agreement, thereby strengthening international cooperation and carbon market mechanisms.

For Azerbaijan, these outcomes reinforce the logic embedded in its national climate strategy: its long-term mitigation targets are explicitly conditional on access to international finance, technology transfer, and cooperative instruments. In this sense, COP29 did not merely elevate Azerbaijan's diplomatic profile but also aligned global finance and cooperation frameworks with the country's implementation-oriented climate policy architecture.

Conclusion

Publicly verifiable evidence supports a clear conclusion: Azerbaijan's climate action is increasingly structured as a practical "commitments-to-delivery" pathway.

At the commitment level, Azerbaijan's participation in Kyoto and Paris—and its updated NDC—provides a measurable direction, including a conditional target of 40% emissions reduction by 2050 compared to 1990.

At the enabling level, enacted laws on renewables and energy efficiency (both adopted in 2021), the stated 2030 renewables objective, and the establishment of an energy efficiency fund create a governance and financing foundation for implementation.

At the delivery level, the commissioning of the 230 MW Garadagh solar plant, the Green Energy Zone initiative with a formal presidential order and international technical cooperation, and the integration of methane action via the Global Methane Pledge together represent concrete, verifiable steps toward emissions reduction.

Finally, hosting COP29 strengthened Azerbaijan's international role in implementation debates—especially climate finance and cooperation mechanisms—aligning domestic ambitions with the global tools that can help deliver them.

List of references

1. Azerbaijan Renewable Energy Agency (AREA). “About Us / Objectives.” Accessed December 5, 2025. <https://area.gov.az/en/page/haqqimizda>.
2. Azerbaijan Renewable Energy Agency (AREA). “Green Energy Zone (GEZ) in the Liberated Territories.” AREA.gov.az. Accessed January 15, 2025. <https://area.gov.az/en/page/layiheler/yasil-enerji-zonasi/yasil>.
3. Azerbaijan Renewable Energy Agency (AREA). “Strategic Objectives and Targets.” Accessed January 15, 2025. <https://area.gov.az/en/page/haqqimizda>.
4. Azərbaycan Respublikasının Milli Qanunvericilik Portalı (e-qanun.az). “Enerji resurslarından səmərəli istifadə və enerji effektivliyi haqqında.” Azərbaycan Respublikasının Qanunu No. 359-VIQ, July 9, 2021. Accessed December 12, 2025. <https://e-qanun.az/framework/48129>.
5. European Bank for Reconstruction and Development (EBRD). Khizi–Absheron Wind Power Project (Azerbaijan): Project Summary Document. Accessed January 5, 2025. <https://www.ebrd.com/work-with-us/projects/psd/khizi-absheron-wind-power-project.html>.
6. EU4Climate. Azerbaijan: Climate Policy and NDC Overview. EU4Climate Programme. Accessed January 5, 2025. <https://eu4climate.eu/countries/azerbaijan/>.
7. EU4Climate. Azerbaijan: Energy Efficiency and Climate Policy Framework. EU4Climate Programme. Accessed January 22, 2025. <https://eu4climate.eu/countries/azerbaijan/>.
8. Felver, Troy B. “How Can Azerbaijan Meet Its Paris Agreement Commitments? Assessing the Effectiveness of Climate Change-Related Energy Policy Options Using LEAP Modeling.” *Heliyon* 6, no. 8 (2020): e04697. <https://doi.org/10.1016/j.heliyon.2020.e04697>.
9. International Energy Agency (IEA). *Energy Efficiency 2023*. Paris: IEA, 2023. Accessed January 5, 2025. <https://www.iea.org/reports/energy-efficiency-2023>.
10. International Energy Agency (IEA). *Global Methane Tracker 2025*. Paris: IEA, 2025. <https://www.iea.org/reports/global-methane-tracker-2025>.
11. Masdar (Abu Dhabi Future Energy Company). “Garadagh Solar Photovoltaic Power Plant – Project Profile.” 2023. Accessed December 25, 2025. <https://masdar.ae/en/renewables/our-projects/garadagh-area-230mw-solar-pv-power-plant>.
12. Ministry of Energy of the Republic of Azerbaijan. “Garadagh Solar Power Plant Official Inauguration.” Press release, October 26, 2023. Accessed January 5, 2025. <https://minenergy.gov.az/en/xeberler-arxivi/00081>.
13. Ministry of Energy of the Republic of Azerbaijan. Law of the Republic of Azerbaijan No. 339-VIQ on the Use of Renewable Energy Sources in the Generation of Electricity, May 31,

- 2021.
14. Organisation for Economic Co-operation and Development (OECD) and International Renewable Energy Agency (IRENA). Policy Pathways for Accelerating Renewable Energy Deployment and Energy Efficiency. Paris/Abu Dhabi: OECD–IRENA. Accessed December 5, 2025. <https://www.irena.org/Publications>.
 15. President of the Republic of Azerbaijan. Decree on the Establishment of the Energy Efficiency Fund, March 1, 2024. Official Legal Information Portal of the Republic of Azerbaijan. Accessed January 5, 2025. <https://e-qanun.az>.
 16. Republic of Azerbaijan. “Azərbaycan Respublikasının işğaldan azad edilmiş ərazilərində ‘yaşıl enerji’ zonasının yaradılması ilə bağlı tədbirlər haqqında.” Prezidentin Sərəncamı No. 2620, May 3, 2021. Official Legal Information Portal of the Republic of Azerbaijan. Accessed February 1, 2026. <https://e-qanun.az/framework/47397>.
 17. Republic of Azerbaijan. Updated Nationally Determined Contributions (Second NDC) of the Republic of Azerbaijan. October 2023. United Nations Framework Convention on Climate Change. Accessed February 2, 2026. https://unfccc.int/sites/default/files/NDC/2023-10/Second%20NDC_Azerbaijan_ENG_Final%20%281%29.pdf.
 18. United Nations Framework Convention on Climate Change (UNFCCC). “COP29 UN Climate Conference Agrees to Triple Finance to Developing Countries, Protecting Lives and Livelihoods.” November 24, 2024. Accessed February 2, 2026. <https://unfccc.int/news/cop29-un-climate-conference-agrees-to-triple-finance-to-developing-countries-protecting-lives-and>.
 19. United Nations Framework Convention on Climate Change. Paris Agreement. Adopted December 12, 2015; entered into force November 4, 2016. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.
 20. United Nations Framework Convention on Climate Change. “Paris Agreement – Ratification Status.”
 21. United Nations Framework Convention on Climate Change. “Parties and Observers: Azerbaijan.” Accessed February 1, 2026. <https://unfccc.int/parties-observers/parties/azerbaijan>.
 22. United Nations Framework Convention on Climate Change. “Status of Ratification of the Kyoto Protocol.” Accessed January 11, 2025. https://unfccc.int/kyoto_protocol.
 23. United Nations Framework Convention on Climate Change. Second Nationally Determined Contribution of the Republic of Azerbaijan. 2023. Accessed February 4, 2026.

<https://unfccc.int/sites/default/files/NDC/2023->

[10/Second%20NDC_Azerbaijan_ENG_Final.pdf](https://unfccc.int/sites/default/files/NDC/2023-10/Second%20NDC_Azerbaijan_ENG_Final.pdf).

24. World Bank. Azerbaijan Systematic Country Diagnostic: Pathways to Inclusive Growth. Washington, DC: World Bank, 2022. Accessed January 5, 2025. <https://www.worldbank.org/en/country/azerbaijan/publication/azerbaijan-systematic-country-diagnostic>.
25. World Meteorological Organization. "COP29 Ends with Compromise on Climate Financing." November 25, 2024. Accessed January 5, 2025. <https://wmo.int/media/news/cop29-ends-compromise-climate-financing>

NEFTDƏN KƏNAR: AZƏRBAYCANIN İQLİM FƏALİYYƏTİ PRAKTİKADA VƏ ONUN İNKİŞAF ETMƏKDƏ OLAN AŞAĞI KARBONLU YOLU

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Xülasə. Bu məqalədə Azərbaycanın beynəlxalq iqlim öhdəlikləri, daxili hüquqi islahatlar və tətbiqə yönəlmiş qurumlar vasitəsilə istixana qazı tullantılarını necə azaltdığı araşdırılır. Burada bərpa olunan enerjinin tətbiqi, enerji səmərəliliyi tədbirləri, metan azaldılması uyğunlaşdırılması və "Yaşıl Enerji Zonası" təşəbbüsü, eləcə də Bakıda COP29-un iqlim maliyyələşdirilməsinin gücləndirilməsində və ölçülə bilən yumşalma tərəqqisi üçün əməkdaşlığın katalitik rolu vurğulanır.

Açar sözlər: İqlim idarəçiliyi, iqlim yumşaldılması, yaşıl inkişaf strategiyası, bərpa olunan enerji, iqlim maliyyələşdirilməsi, istixana qazları, COP29, Paris Sazişi.