

World Science

e-ISSN: 2414-6404

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
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+15878858911
editorial-office@sciformat.ca

ARTICLE TITLE ECONOMIC COOPERATION OF THE SOUTH CAUCASUS
COUNTRIES - A GUARANTEE OF ENERGY SECURITY

DOI [https://doi.org/10.31435/ws.1\(91\).2026.5790](https://doi.org/10.31435/ws.1(91).2026.5790)

RECEIVED 05 January 2026

ACCEPTED 12 March 2026

PUBLISHED 30 March 2026

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ECONOMIC COOPERATION OF THE SOUTH CAUCASUS COUNTRIES - A GUARANTEE OF ENERGY SECURITY

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ABSTRACT

South Caucasus countries: Georgia, Azerbaijan and Armenia are three countries located at the crossroads of Europe and Asia, which have an important function of the South Caucasus Corridor, the movement of energy and vital goods between Europe and Asia is carried out. The three countries have greatly increased rapprochement relations in favor of economic and geopolitical interests. Trilateral relations have old roots, which have been particularly strengthened since 1990, when the South Caucasus pipeline was planned and other promising projects emerged. The economic and geopolitical strategy of these countries depends on stable and voluminous flows of energy from Azerbaijan and the Caspian region and has the aspiration to transform the original peripheral states as the main "bridge" of the Euro-Atlantic space to the Caucasus region. In today's world, the search for efficient use of non-conventional, renewable energy has begun to replace the use of exhaustible energy resources. One of the indicators of the geopolitical role and importance of Georgia is the specific share of electricity obtained from renewable energy sources, especially hydropower, to the total volume of generation by its own means. Despite Georgia, Armenia and Azerbaijan's different population size and ownership of energy sources, a mutual comparison of several energy indicators was carried out in the paper. Each country's energy potential, business doing and economic freedom indices, greenhouse gas emission trends are evaluated.

KEYWORDS

Economic Cooperation, Energy Indicators, Energy Security

CITATION

Maka Jishkariani, Giorgi Duduchava. (2026) Economic Cooperation of the South Caucasus Countries - A Guarantee of Energy Security. *World Science*. 1(91). doi: 10.31435/ws.1(91).2026.5790

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1. Introduction

The countries of the South Caucasus, such as Georgia, Azerbaijan, and Armenia, represent a powerful economic and energy hub in the southern part of the Caucasus, which occupies an important place in the world community. Their favorable location contributes to the connection of the countries of the East with the countries of Europe. The important function of these three countries is the movement of energy and vital cargo between Europe and Asia. In recent times, these three countries have greatly increased their rapprochement relations in favor of energy, economic and geopolitical interests. The energy and economic strategy of these countries depends on stable and large-scale energy flows from Azerbaijan and the Caspian region and aspires to transform the initially peripheral states into the main “bridge” of the Euro-Atlantic space in the Caucasus region (Figure 1).

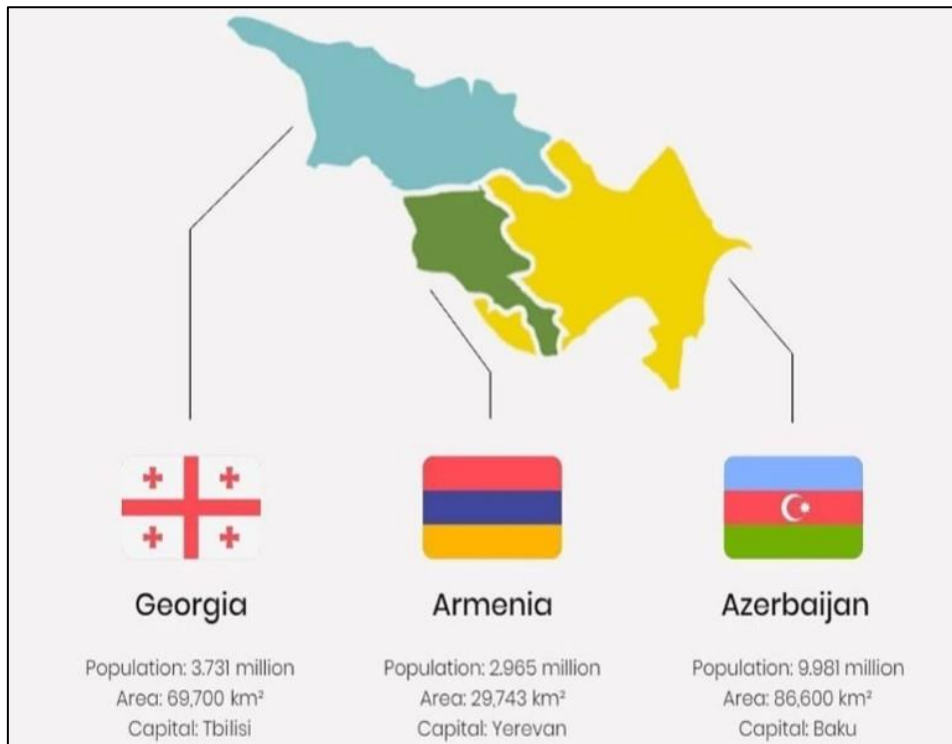


Fig. 1. The countries of the South Caucasus

2. Materials and Methods

The process of creating the paper involved data collection, systematization of statistical material, and construction of appropriate graphs to clearly display the results obtained. Statistical data was collected from the World Bank, the Energy Agency, and other well-known websites around the world. The basis of the study is to determine the size of the country's population, as it is needed for the calculations of most indicators. According to an analysis of the dynamics of population change, one of the components of a country's national wealth, the population of these three countries has undergone dramatic changes over the years. Georgia's population was almost 4 million in 1960, then 5.5 million in 1989. After it embarked on the difficult path of independence, a large part of its population left the country due to difficult living conditions. A very large part of the Georgian population has left their homeland and emigrated to live and work, mainly in the United States and developed European countries. According to 2025 data, Georgian population is about 3.8 million people (Figure 2).

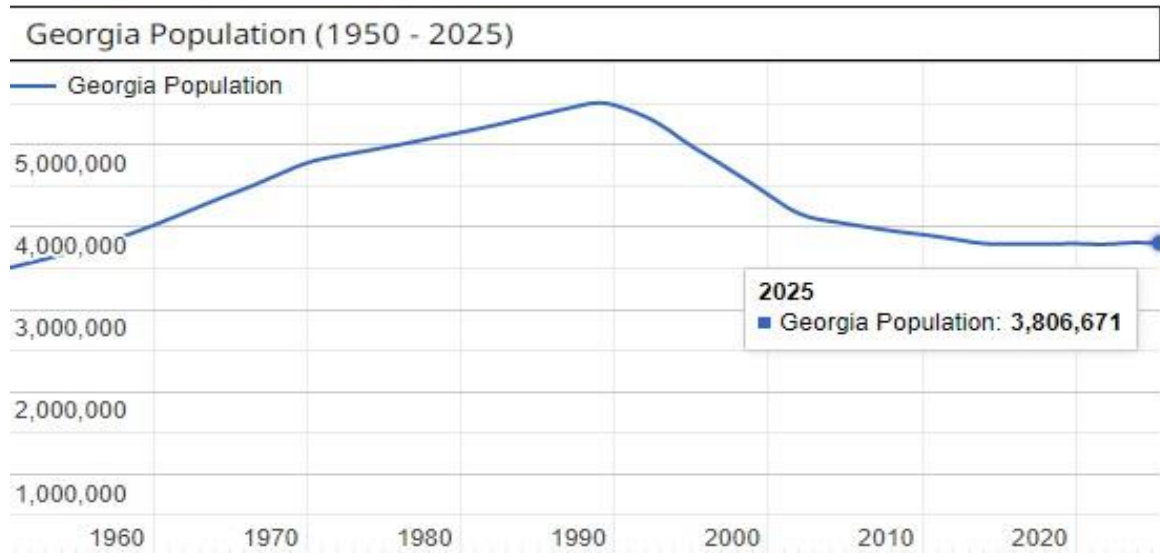


Fig. 2. Population of Georgia

During the same period (1960-2025), Azerbaijan almost doubled its population, due to the country's stable economic environment and religious-traditional values (Figure 3).

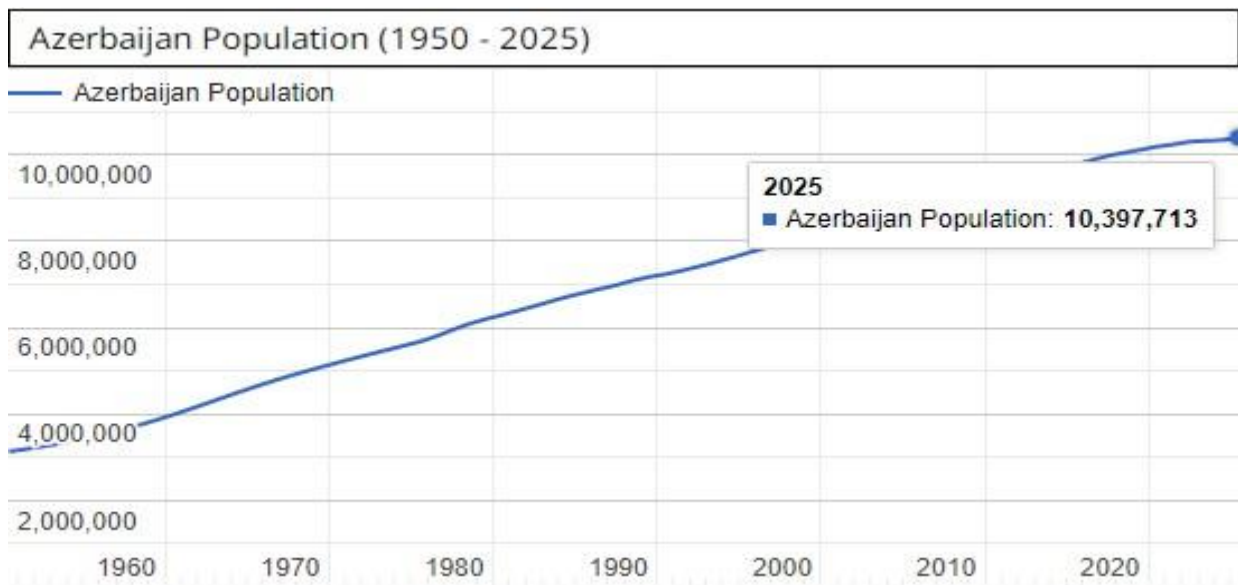


Fig. 3. Population of Azerbaijan

The population of the relatively small Armenia has also doubled in (1960-2025) from 1.5 million to 3 million, despite the fact that in recent years there has also been an emigration of the population, which is due to the country's relatively low economic growth rates (Figure 4).

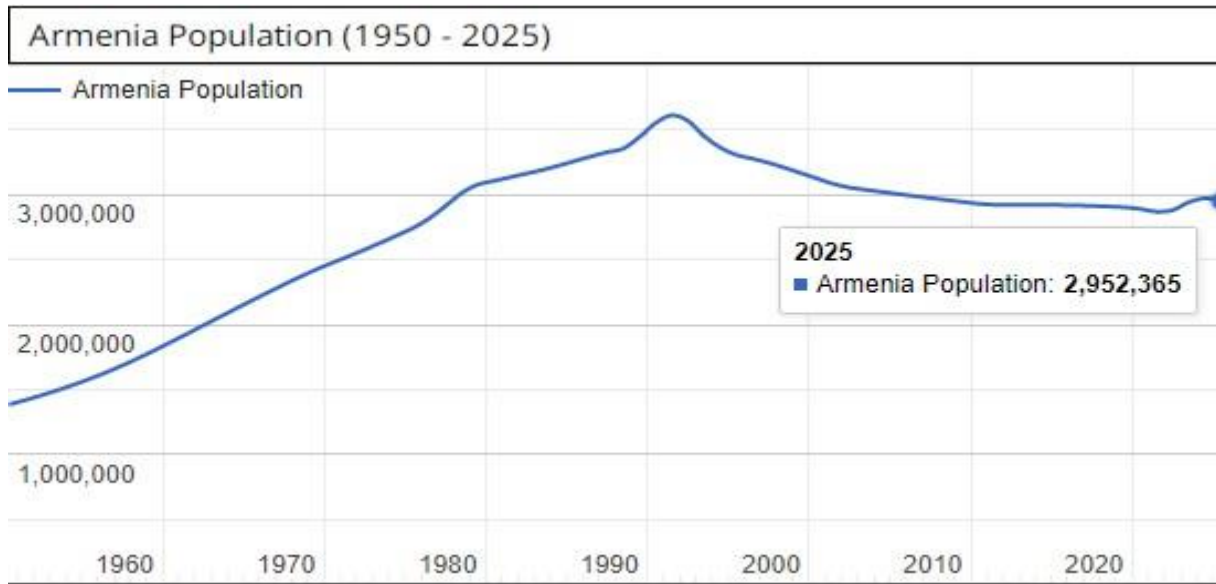


Fig. 4. Population of Armenia

3. Results

3.1. Energy Sources Potential

This section discusses the energy resources of the three countries. Georgia has the largest hydropower resources [1], as there are many rivers where it is possible to build small, medium and large hydropower plants. Primary Energy Sources of Georgia, 2024: 80% Hydro Resources; 10% Coal; 3% Biomass and waste; 6% Petroleum products (gasoline, diesel fuel, kerosene and jet fuel); 1% Local natural gas. Primary Energy Sources of Azerbaijan, in 2024: Oil and Gas - 80%; Renewable - 20%. Azerbaijan has large amounts of oil and natural gas, which it actively uses for domestic consumption and also exports [2]. Energy Installed Capacity of Azerbaijan in 2024 is 8371 MW: from which Thermal Power Plant - 80%; Renewable-20%. Renewable power plants includes: Hydro PP, Solar PP, Wind PP, Waste PP, and A biomass thermal PP. Armenia is relatively poor in energy resources, so it is forced to have a nuclear power plant to meet local demand for electricity [3]. There is Diversity of sources and PPs in 2024, and Mostly uses fossil Fuels: Thermal Power Plant - 43%; Nuclear PP-30%; Hydro PP-22%; Other Renewable: Solar PP, Wind PP, A biomass thermal power plant- 3.8%.

3.2. Index of Overall Economic Freedom

According to the Economic Freedom Index indicator scale, 0 is repressive, and 100 is free from state influence. A score of (79.9 - 70) indicates a mostly free environment, while (69.9 - 60) indicates a moderately free environment from government pressure [4]. The graph of the Economic Freedom Index for three countries shows that in 2024 Georgia Azerbaijan and Armenia were moderately free: Georgia - 68.4; Armenia - 64.9; Azerbaijan - 61.6 (Figure 5).

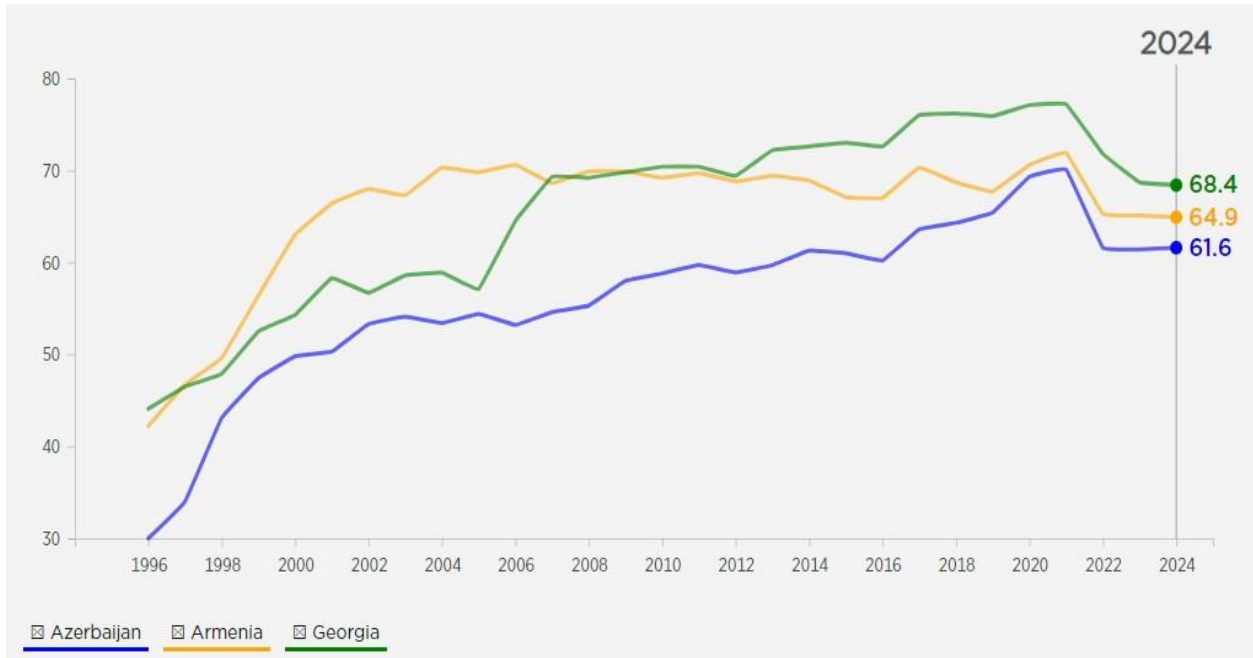


Fig. 5. Economic Freedom Index

3.3. Doing Business Index of Georgia, Azerbaijan and Armenia

According to the Doing Business Index indicator scale, 100 corresponds to the ease of doing business [5]. The graph of the Doing Business Index for the three countries shows that Georgia has a better indicator in 2024 than Armenia and Azerbaijan, which were almost at the same level: Georgia-74.4; Azerbaijan - 69.2 and Armenia - 69.2 (Figure 6).

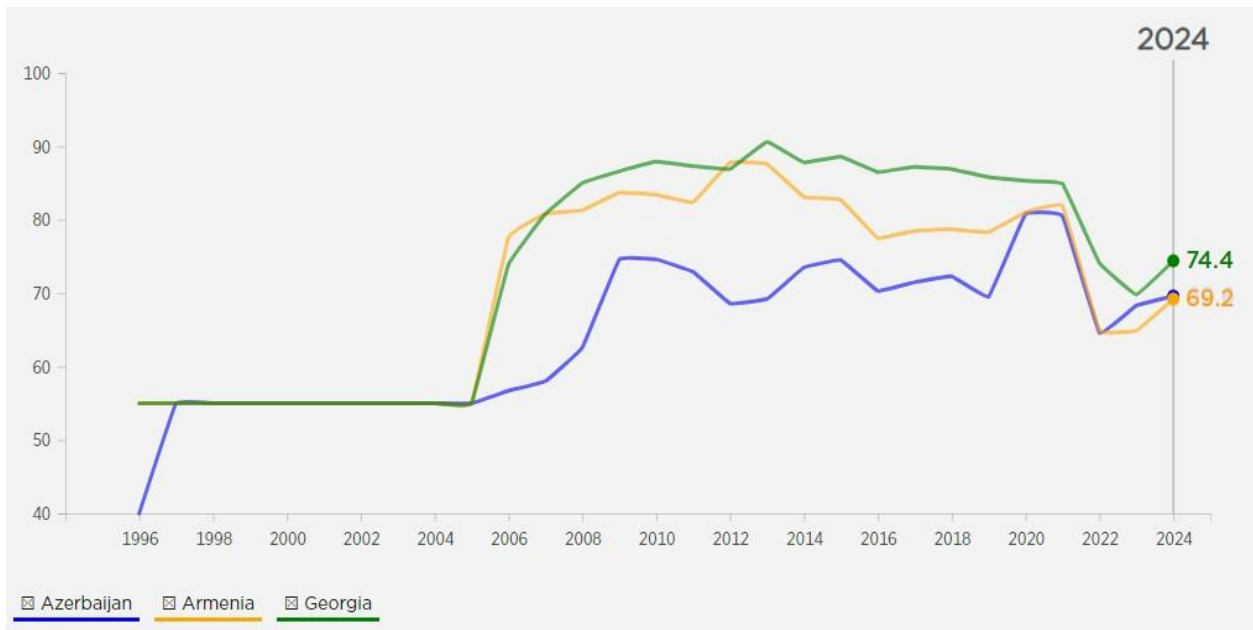


Fig. 6. Doing Business Index

3.4. GDP of Georgia, Azerbaijan and Armenia

The Gross Domestic Product indicator is one of the determinants of a country's economic strength [6]. As the graph shows, in 2024 Azerbaijan was leader - 74.32; Georgia- 33.78; Armenia -25.79 Billion USD\$. Although Azerbaijan was the leader, the GDP of all three countries were growing and rising (Figure 7).

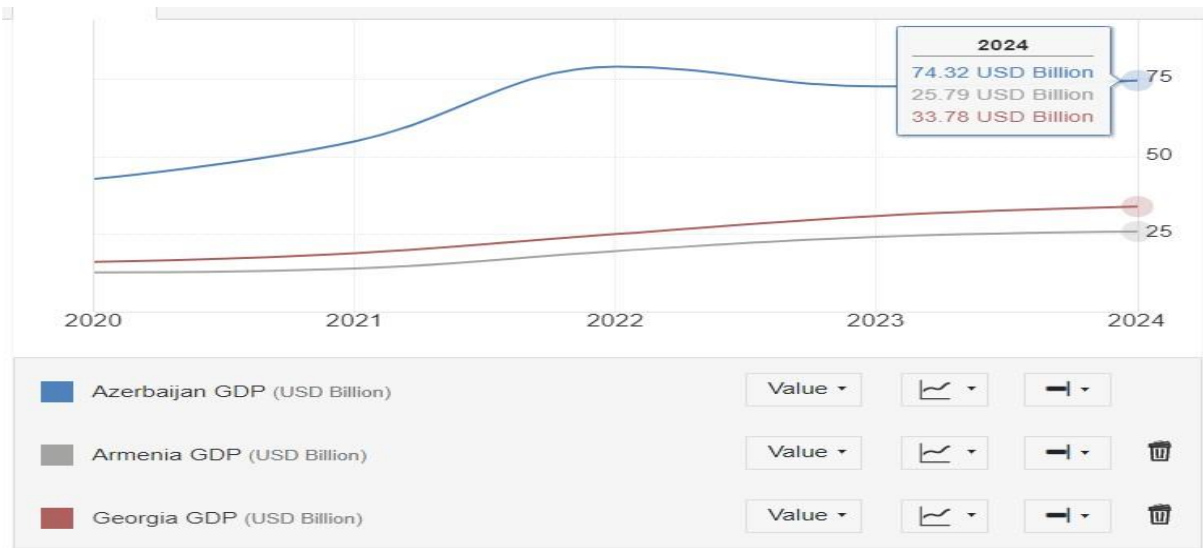


Fig. 7. The Indicator of Gross Domestic Product

3.5. Inflation Index in Percentage Terms

The indicator reflects the level of stability of the country [7]. As can be seen from the graph, the highest inflation level according to November 2025 data is in Azerbaijan (5.5%), followed by Georgia (4.8%) and then Armenia (3.1%) see figure 8.

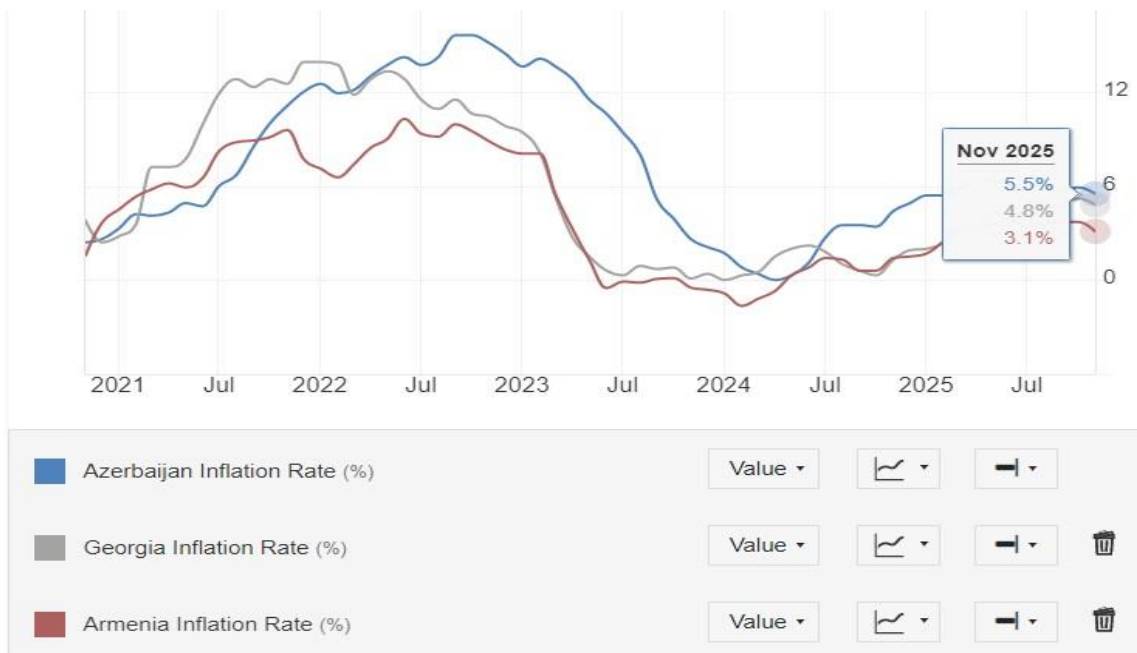


Fig. 8. Inflation Index

4. Discussion

4.1. Carbon dioxide Emission of Country (Annual)

This indicator Involves Carbon dioxide CO₂ emissions from burning fossil fuels and industrial processes [8]. Also includes emissions from transport, electricity generation, and heating (Figure 9). Azerbaijan leads in this indicator in 2024 (39.83 million ton). This high rate is related to the country's high level of industrialization and the large use of petroleum products [9]. As for Georgia (11.78 million ton) and Armenia (7.43 million ton), industrial processes in these countries have been reduced, and at the same time, renewable energy sources are increasingly used for electricity generation [10].

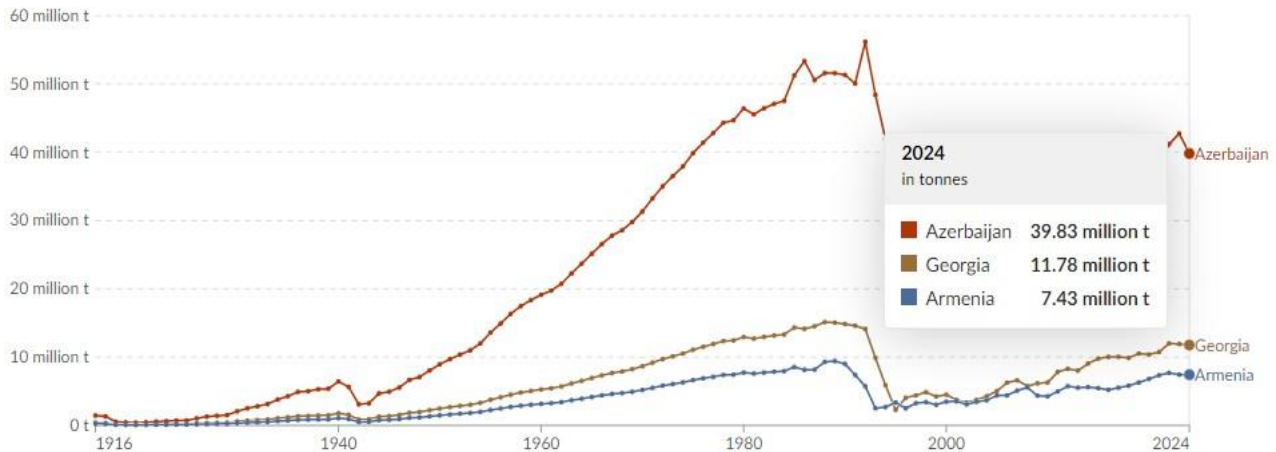


Fig. 9. Carbon dioxide Emission of Country

4.2. Carbon dioxide CO₂ Emissions per Capita Population

This indicator measures the average amount of carbon dioxide emitted per capita in a country or region each year, calculated by dividing total annual emissions by the total population, which helps compare environmental impacts between countries of different sizes, but typically focuses on emissions within a country's borders [11]. The indicator will reveal inequalities, where large nations may have high total emissions but lower per capita impacts than smaller, high-consumption countries [12]. As the graph (Figure 10) shows, Azerbaijan has the highest rate in 2025 (3.85 ton per person), followed by Georgia (3.09 Tons per person) and Armenia (2.5 tons per person).

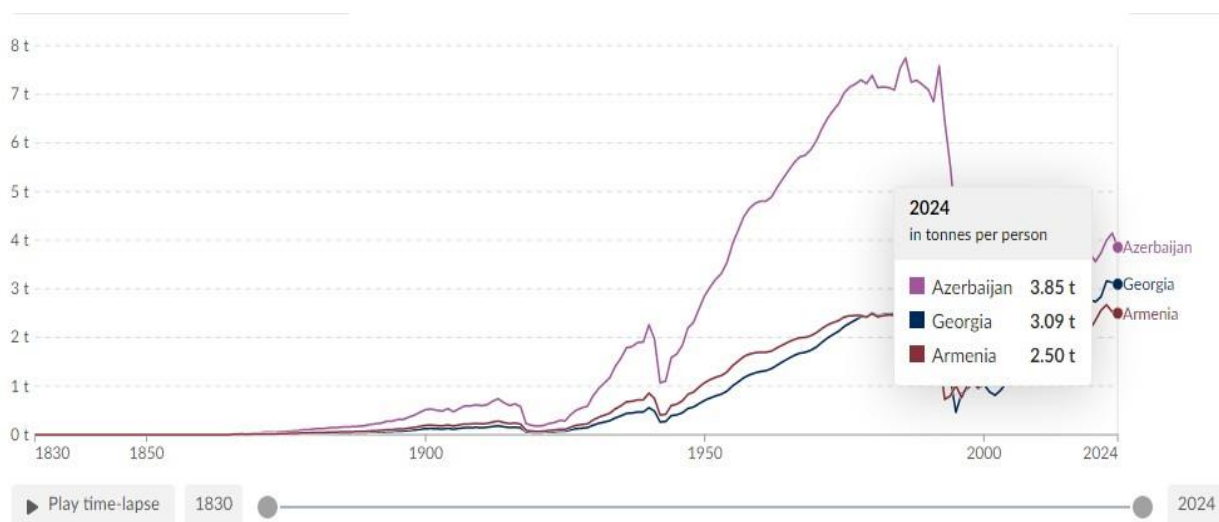


Fig. 10. Carbon dioxide Emissions per Capita Population

4.3. Greenhouse Gas Emissions of Country (Annual)

This indicator include Carbon dioxide, Methane and Nitrous Oxide from all sources, including land-use change [13]. They are measured in tons of carbon dioxide-equivalents (CO₂ equivalent) see figure 11. This indicator is for national-level climate impact, country comparisons, and compliance with international climate agreements, such as the Paris Agreement. Azerbaijan leads this indicator in 2024 (57.34 million ton) due to energy, industry, transport and agriculture development, followed by Georgia (12.43 million ton) and Armenia (10.31 million ton).

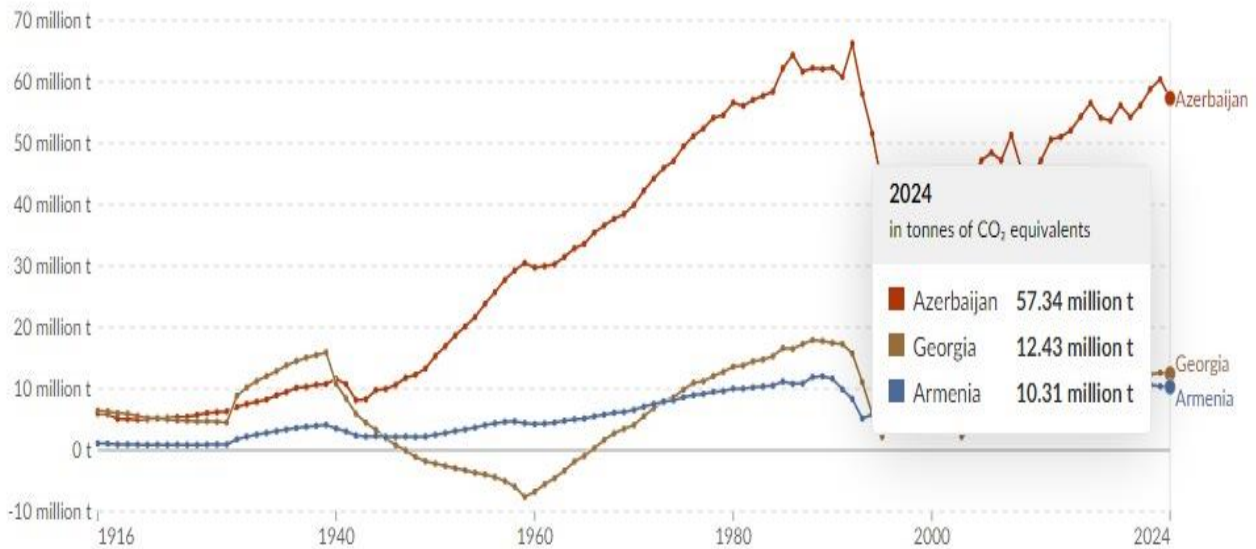


Fig. 11. Greenhouse Gas Emissions

4.4. Greenhouse Gas Emissions Per Capita Population

This indicator means the total amount of heat-trapping gases divided by the number of population [14]. These gases are released into the atmosphere as a result of the activities of this country, these activities are: energy, industry, transport, agriculture, which is often measured in CO₂ equivalent, which reflects its contribution to global warming and climate change [15]. Azerbaijan (5.5 ton/person) is the leader in this indicator in 2024, followed by Armenia (3.5 ton/person) and Georgia (3.3 ton/person) (Figure 12).

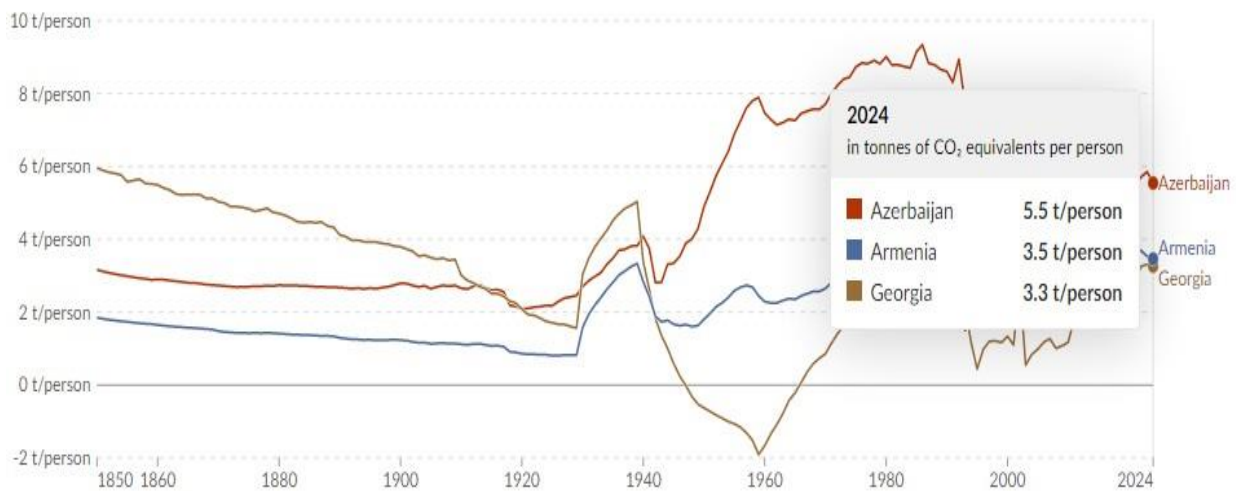


Fig. 12. Greenhouse Gas Emissions per Capita Population

5. Conclusions

Despite the different population sizes and energy resources of Georgia, Armenia, and Azerbaijan, these three countries are linked by a strong trade partnership. It is strategically beneficial for all three countries to export energy resources to more reliable and friendly markets, thereby strengthening their geopolitical importance. These three countries have close energy ties, which is reflected in the export-import of electricity. As for gas supplies, Georgia receives almost 90% of its natural gas from Azerbaijan. Ultimately, as a result of the trilateral partnership, the “narrow national interests” of the three states will be replaced by broader benefits, increasing financial and energy security.

Research Data: All Data used in this article is available at:

1. <https://www.worldometers.info/world-population/population-by-country/>
2. <https://ourworldindata.org/co2-and-greenhouse-gas-emissions>
3. <https://tradingeconomics.com/>
4. <https://www.heritage.org/index/pages/all-country-scores>

Grant Support Details: This research did not receive any financial support.

Conflicts of Interest: The authors declare no conflicts of interest regarding the publication of this paper.

Funding Statement: No funding was received for this paper.

Conflict of Interest Statement: The author knows of no conflicts of interest.

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