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Research Article

Strategic Analysis of the Southern Gas Corridor: SWOT Assessment and Future Prospects in the European Energy Market

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Abstract

This study conducts a SWOT analysis of the Southern Gas Corridor (SGC) as an energy initiative operating in the transnational natural gas sector. The findings indicate that SGC's key strengths include its role in energy diversification and geopolitical leverage, while its weaknesses stem from infrastructure vulnerabilities and dependence on regional stability. Additionally, opportunities such as increasing European energy demand and potential strategic partnerships are identified, alongside threats, including geopolitical tensions and regulatory uncertainties. Based on these insights, the study offers strategic recommendations for SGC's management to mitigate risks, optimize growth opportunities, and strengthen its market position through diversified investment strategies, resilient infrastructure development, and adaptive regulatory compliance.

Keywords: Strategic Management, Strategic Planning, SWOT Analysis, Energy Demand and Supply, South Gas Corridor

JEL Codes: L20, M16, M21, Q40, Q41

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Güney Gaz Koridoru'nun Stratejik Analizi: SWOT Değerlendirmesi ve Avrupa Enerji Piyasasına Yönelik Gelecek Beklentileri

Öz

Bu çalışma, ulusötesi doğal gaz sektöründe faaliyet gösteren bir enerji girişimi olan Güney Gaz Koridoru'nun (SGC) SWOT analizini yapmaktadır. Bulgular, SGC'nin temel güçlü yönlerinin enerji çeşitlendirmesi ve jeopolitik kaldıraçtaki rolünü içerdiğini, zayıf yönlerinin ise altyapı zayıflıklarından ve bölgesel istikrara olan bağımlılıktan kaynaklandığını gösteriyor. Ayrıca, jeopolitik gerilimler ve mevzuat belirsizlikleri gibi tehditlerin yanı sıra Avrupa'nın artan enerji talebi ve potansiyel stratejik ortaklıklar gibi fırsatlar da tespit ediliyor. Bu içgörülere dayanarak çalışma, SGC yönetimine riskleri azaltmak, büyüme fırsatlarını optimize etmek ve çeşitlendirilmiş yatırım stratejileri, esnek altyapı geliştirme ve uyarlanabilir mevzuat uyumluluğu yoluyla pazar konumunu güçlendirmek için stratejik öneriler sunuyor.

Anahtar Sözcükler: Stratejik Yönetim, Stratejik Planlama, SWOT Analizi, Enerji Talebi ve Arzı, Güney Gaz Koridoru

Jel Sınıflandırması: L20, M16, M21, Q40, Q41

1. Introduction

Strategic management is a multifaceted process that involves forecasting and planning for the long-term development of a project. It encompasses the implementation, monitoring, and evaluation of strategies. Strategic management necessitates a systematic approach to internal and external factors that influence the company. It involves developing and executing strategies that enable the company to navigate potential environmental changes, ensuring its survival and adaptability (Raluca, 2013).

The process of strategic management commences by assessing the organization's mission, objectives, and existing strategy. This is followed by a comprehensive SWOT analysis of the current situation. The situation analysis serves as the foundation for formulating well-defined strategic plans, which are subsequently put into action. Strategic thinking necessitates a forward-looking perspective that encompasses both the internal dynamics of the organization and the competitive landscape. It entails the ability to perceive the broader context and consider how all the elements interconnect and align (Guga, 2010).

SWOT analysis is an important tool for comprehensively evaluating businesses. If the outcomes of the SWOT analysis are understood, it will be easier to achieve the strategic goals of the organization. What makes SWOT particularly powerful is that it helps you uncover opportunities that you can exploit. In addition, SWOT provides information about the current and future position of the organization or project.

When considering environmental data to evaluate a project, a SWOT analysis reveals what actions are required to achieve the project's goals and what problems need to be overcome. It shows where the project can be positioned today and in the future.

Unlike Nord Stream, which relies heavily on Russian gas supplies and has faced operational disruptions due to geopolitical tensions, the Southern Gas Corridor (SGC) provides an alternative route for delivering Caspian gas to European markets, thereby enhancing energy security and supply diversification. The SGC, spanning Azerbaijan, Georgia, Turkey, and Southern Europe, plays a crucial role in reducing European dependence on Russian energy by integrating gas supplies from the Caspian region, particularly Azerbaijan's Shah Deniz field (Bocse, 2021).

Nord Stream has been subject to geopolitical risks, including supply cuts and sanctions following the 2022 Russian invasion of Ukraine, highlighting the need for diversified energy corridors (Virág, 2023). The European Union's energy diversification strategy, as outlined in the REPowerEU plan, further underscores the strategic importance of the SGC in achieving long-term energy security and stability in Europe.

Large-scale energy projects require strategic management due to their long-term nature and geopolitical sensitivities. These projects face challenges such as high investment costs, political risks, and market uncertainties, making adaptive strategies essential for their success (Virág, 2023). Energy market volatility, in particular, has a significant impact on the financial sustainability of such projects. The European Union's *REPowerEU* plan, introduced in 2022, exemplifies a strategic response to energy security concerns by promoting energy savings, supply diversification, and accelerating the transition to clean energy sources (European Commission, 2022).

The Southern Gas Corridor (SGC) plays a crucial role in European energy security, but several key questions arise regarding its future. What are the key strengths, weaknesses, opportunities, and threats of the Southern Gas Corridor (SGC), and how can it enhance its resilience to geopolitical and economic uncertainties? This question is vital for understanding the SGC's current position and its ability to adapt to evolving energy dynamics. In this study, this question will be explored by analyzing the corridor's strategic advantages and challenges, its role in energy diversification, and its potential to integrate with the EU's green energy transition.

2. Strategic Management

The concept of strategic management was conceived as a budgetary exercise suited for the social and economic environment of the 1960s. In the 1970s, competitive strategic planning was developed through strategic management, analysis of the business environment, competitive analysis, and evaluation of strategic options. Strategic management has developed with a planning process that allows organizations to manage by gaining advantage, which includes planning activity that encompasses various management environments and rules.

According to Mintzberg and Waters (1990), strategy formulation is often driven by the vision, judgment, and expertise of the entrepreneurs who spearhead the project. Additionally, David suggests that strategic management encompasses the art and science of developing, assessing, and executing cross-functional decisions that empower an organization to accomplish its goals (David & David, 2013).

According to David, strategic management can be defined as "the art and science of formulating, implementing, and evaluating critical management decisions that enable an organization to accomplish its long-term objectives." This definition emphasizes the comprehensive nature of strategic management, encompassing the formulation of strategies, their implementation throughout the organization, and the ongoing evaluation of their effectiveness in achieving long-term goals (David & David, 2013).

According to Pearce and Robinson, strategic management is a process that involves conducting analyses, undertaking management activities, and making crucial decisions which result in developing and implementing long-term plans to achieve an organization's strategic objectives. This definition highlights the systematic and proactive nature of strategic management, emphasizing the need for careful analysis, thoughtful decision-making, and effective planning to guide the organization towards its desired long-term goals. (Pearce & Robinson, 2015). In an attempt to achieve long-term sustainability, strategic management helps organizations adapt by understanding the strengths-weaknesses-opportunities-threats, aspects that support the organizations in achieving their vision and mission.

The success of an organization today does not guarantee the success of tomorrow. Therefore, an organization should be able to manage today to set up success in the future. (Kotler & Keller, 2016). If the analysis is done with accurate, realistic, timely, and concrete data, the information obtained and the measures formulated can be very helpful in strategic business management.

The purpose of strategic management is to create and use new methods. In this respect, it differs from long-term planning. Long-term planning aims to optimize the present initiatives to better serve future outcomes or needs.

Strategic management, as an effort to achieve long-term sustainability, helps organizations adapt well to the business environment by understanding their strengths, weaknesses, opportunities, and threats, which helps organizations achieve their vision and mission. Strategic management is the planning process that will allow managers at various levels, in a firm's hierarchy, to ensure effective decision-making.

The ability to navigate market fluctuations and geopolitical disruptions is critical to maintaining financial stability and operational continuity (Tagliapietra, 2023). In this context, strategic management approaches are vital for minimizing risks and maximizing opportunities. Additionally, sustainability strategies must be integrated into project planning to address environmental and social concerns (Stevenson & Roberts, 2021).

Stakeholder engagement and collaboration play a crucial role in the strategic management of large-scale energy projects. The success of these projects depends on the active involvement and support of all relevant stakeholders, including governments, private investors, and local communities (Hanson et al., 2024). Therefore, stakeholder analyses should be conducted, and effective communication strategies should be developed to ensure alignment with project objectives. Moreover, risk management frameworks should be carefully planned and implemented to mitigate potential disruptions.

In conclusion, strategic management is a key determinant of the success and sustainability of large-scale energy projects. Adaptive strategies, uncertainty management, stakeholder participation, and risk mitigation are essential components in ensuring these projects remain viable in dynamic and unpredictable environments. Drawing from contemporary strategic management literature and best practices will further enhance the resilience and effectiveness of energy infrastructure investments.

3. SWOT Analysis

SWOT analysis is a strategic planning tool widely utilized across various sectors to assess internal and external factors influencing an organization. It comprises four components: strengths, weaknesses, opportunities, and threats, which together provide a comprehensive overview of an entity's strategic position. This analysis aids in aligning strategies with market dynamics and enhancing competitive advantage, making it essential for effective decision-making and organizational growth.

While SWOT analysis is a powerful tool for strategic planning, it is essential to recognize its limitations, such as potential oversimplification of complex situations and the need for continuous updates to remain relevant in dynamic environments

The SWOT analysis shows the areas that need to be prioritized when creating an action plan for a project. SWOT analysis ensures that perceived capabilities are recognized and valued by the parties involved in the project (Phadermrod et al., 2019). Specifically, strengths and weaknesses are identified in the internal environment of the project. Likewise, opportunities and threats are obtained by looking at current competitors and the external environment.

SWOT analysis enables the effective formulation of strategic plans to sustain and increase satisfaction. Thus, it facilitates the project's acquisition of a competitive advantage. The SWOT analysis, which provides an opportunity to review the project's strategic direction and status, as well as the anticipated external environmental trends, allows the project to be positioned more competitively in the future. SWOT is a helpful tool to reveal the situational analyses prior to the development of strategic actions.

S – Strengths: refers to the state of being effective in an area. It shows the distinctive features of the project, particularly in comparison with its competitors. These features give the project a certain advantage over others.

Conditions such as cost, access to benefits and financial resources, qualified employees, and high efficiency clearly reveal the competitiveness of the project. In other words, it highlights the strong points of the project.

W: Weaknesses of the project are those that will hinder activity execution. In other words, it refers to weaknesses such as an unskilled labor force, poor management, outdated technical systems, a lack of knowledge, or a lack of financial resources. Some structures within the organization may contain weaknesses or negative aspects.

Opportunities (O) are positive external factors for the organization. In other words, the goal is to create a new strategy to profitably exploit efficiency. Opportunities must be identified to create the required strategy for each business. Often, investments and new structures lead to time savings. Opportunities are predictable. Identifying and evaluating them is important. Depending on management's ability to respond to this situation, a business may be consistently profitable and viable.

T- Threats are negative external factors for the company. It is a situation that can significantly affect the strength of the company, reduce financial results, and impair marketing efforts. Threats can be political, social, legal, natural, economic, technical, financial, commercial, etc.

SWOT analysis, despite its historical significance in strategic planning, has several limitations that can reduce its effectiveness in modern decision-making. One major drawback is its narrow focus on internal factors, as it primarily evaluates strengths and weaknesses while often overlooking the dynamic external environment that shapes strategic outcomes (Westover, 2024). This internal orientation can cause organizations to miss critical market opportunities and external threats, limiting their ability to adapt to competitive pressures and industry changes (Agarwal et al., 2012). Additionally, the lack of structure and actionability in the SWOT framework makes it difficult to prioritize key issues, leading to challenges in translating findings into concrete strategic actions. Without a systematic approach to ranking or weighting factors, decision-makers may struggle to develop actionable strategies that align with long-term business objectives.

4. Southern Gas Corridor (SGC)

Graphic 1: Southern Gas Corridor (SGC)



Source: <https://www.sgc.az/en>

The Southern Gas Corridor comprises several projects, namely the development of the Shah Deniz gas-condensate field (SD1 and SD2), the expansion of the South Caucasus Pipeline (SCPX), the construction of the Trans Anatolian Natural Gas Pipeline (TANAP), and the establishment of the Trans Adriatic Pipeline (TAP). With the completion of the SD2 project, an additional 16 billion cubic meters of natural gas production capacity was added to the existing 11 billion cubic meters capacity

of the SD1 project. The combined length of the newly constructed SCPX, TANAP, and TAP pipelines amounts to 3,200 kilometers (Rzayeva, 2015).

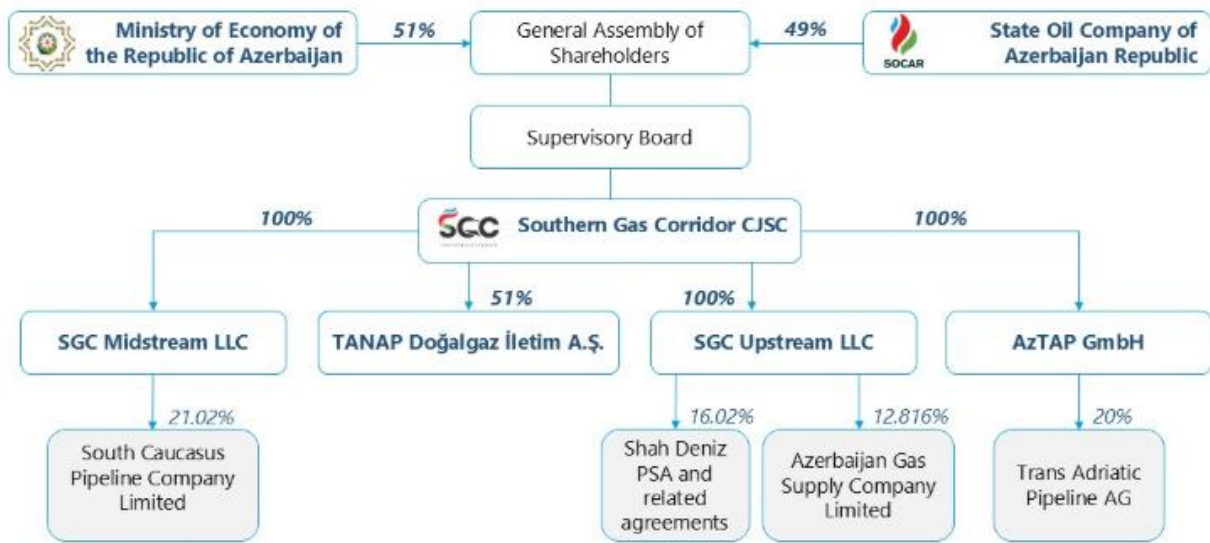
The first phase of the Shah Deniz field, known as SD1, was initiated in the 2000s. It has a production capacity of approximately 10 billion cubic meters of gas per year and around 50,000 barrels of condensate per day. The second phase, SD2, has a larger capacity, capable of producing 16 billion cubic meters of gas per year (Shokri Kalehsar, 2021b). When combined with the output from the first phase, the total production capacity of the Shah Deniz field reaches 26 billion cubic meters of gas per year. Shareholders of Shah Deniz are BP – 29.99%, SGC-21.02%, Lukoil– 19.99%, TPAO– 19%, NICO – 10% (Aliiev, 2022:210).

The SCPX, which is part of the Southern Gas Corridor, serves as the initial segment in a series of pipelines that constitute a new route for transporting Caspian gas to Europe. Stretching 692 kilometers, the SCPX is specifically designed to convey gas from the Shah Deniz field located in the Azerbaijani sector of the Caspian Sea through Georgia, ultimately reaching the Georgia-Turkey border (BP, 2023). Shareholders of SCP: BP - 29.99%, SGC- 21.02%, Lukoil - 19.99%, NICO -10% and TPAO - 19% (Rzayeva, 2015).

As the longest (1811 km) and having the largest diameter (56"), TANAP is a natural gas pipeline in Turkey, the Middle East, and Europe, and serves as a vital conduit for transporting natural gas sourced from Azerbaijan's Shah Deniz Field. Its primary objective is to deliver this natural gas to Turkey and subsequently to Europe. With its aim to enhance energy supply security for both Turkey and Europe, TANAP plays a significant role in fostering closer relations between Azerbaijan, Turkey, and the European Union. Moreover, it has the potential to reshape the geopolitical landscape of global energy dynamics. Shareholders of TANAP: SGC (51 %), BOTAS (30%), BP (12%), Socar Türkiye Energy (7%) (Azakov, 2018).

TAP is an essential infrastructure that enables the transportation of natural gas from the Caspian basin to Europe. It is interlinked with the Trans-Anatolian Pipeline (TANAP) at the Greece-Turkey border and extends through northern Greece, Albania, and the Adriatic Sea, ultimately reaching Southern Italy to connect with the Italian gas grid. Initially, TAP operates with a capacity of 10 billion cubic meters per year. However, by incorporating two compressor stations and making necessary modifications to existing ones, the pipeline's throughput capacity can be expanded to accommodate up to 20 bcm per year. This enhanced capacity contributes to the efficient and reliable delivery of natural gas to meet the energy needs of European markets. Shareholders of TAP: BP – 20%; SGC – 20%; Snam – 20%; Fluxys – 19%; Enagas – 16%; Axpo - 5%. (Yorucu & Mehmet, 2022).

Graphic 2: The organisational structure of Southern Gas Corridor CJSC



Source: www.sgc.az/en/page/1

Spanning seven countries and covering a vast distance, the Southern Gas Corridor represents one of the most intricate gas value chains ever established. With the involvement of over a dozen prominent energy companies, this ambitious project requires a substantial investment of approximately US\$35 billion. It encompasses multiple distinct energy initiatives that collectively contribute to the overall success of the corridor. The magnitude and scale of the Southern Gas Corridor highlight its significance as a major infrastructure development in the energy sector (Amirova-Mammadova, 2018).

If the main purpose of importing gas from the Caspian region in the 2000s was to make a significant contribution to Europe's energy security, the achievements have been modest. The security benefits of SGC appear particularly dubious due to the large number of crisis zones. Expectations for the EU to import more natural gas from the Caspian region and Central Asia will also depend on the continuation of geopolitical considerations, rather than ethical and environmental concerns, prevail in the EU (Amirova-Mammadova, 2018).

The North-South Gas Corridor presents a significant opportunity for Poland and other Central European countries to diversify their gas distribution resources. One of the primary advantages of this corridor is its ability to assert energy sovereignty and reduce dependence on Russia, which has historically held a key position in the Central European energy market. The corridor provides a reliable and secure supply of gas, helping to alleviate restrictions and ensure consistent gas management in Europe. Moreover, it facilitates the development of local gas networks and enables interconnections for both export and import purposes. Overall, the North-South Gas Corridor offers numerous benefits for the region in terms of energy security and enhanced gas distribution capabilities (Hebda, 2021).

The Southern Gas Corridor has emerged as a successful project among the various initiatives endorsed by the EU and its partners. This strategic endeavor, promoted by the EU, aims to enhance long-term energy security by facilitating the supply of gas from the Caspian Basin region and the Middle East to Italy. To further develop and expand this important corridor, the EU actively encourages collaboration with gas suppliers in the region, such as Azerbaijan, Iraq, and Turkmenistan, while closely cooperating with transit countries like Georgia and Turkey. The European Commission has defined this project as a crucial step towards establishing a new and reliable gas supply route

connecting the Caucasus and the Caspian Sea region to Europe, ensuring greater energy diversification and resilience. (Camacho & Fernandes, 2019).

Future EU gas demand, is expected to rise again after the 2009 decline. The adoption of environmental policies aimed at reducing CO₂ emissions indicates that natural gas will play an important role in EU energy strategy in the coming years. Expected increased consumption and highly concentrated supply (and partly unstable), dependence on the supply side require policy makers and energy companies to seek alternative sources, specifically for European markets. In this sense, the development of the Southern Gas Corridor with LNG represents a plausible choice, that should become a key priority. Italy has strategic interests in the development of the Southern Gas Corridor. To meet the growing demand and play an important role in the EU gas market, the pipeline should be included in the corridor's main transit routes. Italy's credibility in this competition will be determined by its capacity to offer and support an economically viable and cost-effective market-oriented transport solution with a strong industrial and commercial justification (Amirova-Mammadova, 2018).

5. Methodology

This section outlines the purpose, significance, scope, limitations, data collection, and methodology used in the study. Given the strategic nature of the Southern Gas Corridor (SGC) and its geopolitical significance, a structured analytical approach is necessary to assess its strengths, weaknesses, opportunities, and threats.

The aim of the study is to identify the strategy of the Southern Gas Corridor Initiative by conducting a SWOT analysis. The analysis of the internal and external factors affecting the Southern Gas Corridor identifies threats, opportunities, weaknesses, and strengths. Thus, the objective is to guide the Southern Gas Corridor Initiative in following the most reasonable strategies.

This study employs SWOT analysis to evaluate the strategic positioning of the Southern Gas Corridor (SGC) project. Given its structured approach to assessing both internal strengths and weaknesses alongside external opportunities and threats, SWOT analysis is particularly suited for analyzing large-scale, multi-country infrastructure projects. SGC's strategic landscape enhances its value as a tool for policymakers and project managers.

One key advantage of SWOT analysis is its flexibility in identifying critical factors affecting the success of large infrastructure projects. By systematically categorizing internal and external factors, SWOT helps decision-makers align their strategies with existing strengths while mitigating weaknesses and external risks (Stevenson & Roberts, 2022). This adaptability allows for a more nuanced approach to strategic planning, ensuring that both operational and geopolitical considerations are effectively addressed.

The collection and analysis of data from activity reports involves obtaining and evaluating information related to the strategic management of the projects. These data include information reported by the Southern Gas Corridor, regarding the internal and external factors.

The main body of the study focuses on the Southern Gas Corridor initiative, which passes through six countries: Azerbaijan, Georgia, Turkey, Greece, Albania, and Italy (Shokri Kalehsar, 2021b).

The findings of the study indicate significant strategies to be pursued by the initiative that affects a wide geography. This implies that the impact will be greater when strategies are implemented for the SGC.

The reliability of the study is ensured by utilizing official activity reports, academic literature, and industry publications, which provide consistent and verifiable data on the Southern Gas Corridor (SGC). The validity of the findings is strengthened through data triangulation, where information from multiple sources—including policy documents, market reports, and international energy organizations—is cross-verified to enhance accuracy and contextual relevance.

In conclusion, this section has described the purpose, significance, scope, and limitations of the research. Information has been provided on the collection and analysis of data from activity reports, the characteristics of the main population, and a summary of the research findings.

5.1. The Purpose and Importance of the Research

The aim of the research is to determine and evaluate the strategy of the Southern Gas Corridor Initiative. To achieve this goal, the internal and external factors influencing the Southern Gas Corridor are analyzed using a SWOT analysis. The research aims to assist the Southern Gas Corridor in effectively leveraging its strengths to maximize opportunities and address its weaknesses .

The significance of the research lies in the strategic importance of the Southern Gas Corridor in the energy sector. The SGC aims to transport natural gas reserves from Azerbaijan to Central and Southern Europe, thereby enhancing energy security and diversification. This project promotes regional cooperation and contributes to the diversification of Europe's energy supply. Therefore, the research contributes to the effective implementation of the strategic management of the SGC by evaluating a significant initiative in the energy sector. Thus, the aim is for the Southern Gas Corridor Initiative to follow the most reasonable strategies.

5.2. Scope and Limitations of the Study

The scope of the research includes the examination of the Southern Gas Corridor formed by the Shah Deniz 1 and 2, SCP, TANAP, and TAP projects. However, the study's limitations lie in the analysis based on data from activity reports and the limited access to other data sources.

In the research, information related to the SGC was accessed from the following websites: <https://www.sgc.az/en>, <https://www.tap-ag.com/about-tap/the-big-picture/the-southern-gas-corridor>, and <https://www.tanap.com/en/southern-gas-corridor>. The scope of the research is based on the data available in the activity reports of the projects, by the SGC initiative. These reports consist of information provided by the SGC management. To address this limitation, future research could incorporate expert interviews or primary data collection to enhance the robustness of the analysis.

5.3. Data Collection and Analysis

The research utilized SWOT analysis as a beneficial tool for informing strategic management in business administration. In this study, information related to the strategic management of the SGC was collected, and future-oriented strategies were analyzed using SWOT analysis.

This study is based on a comprehensive review of official activity reports obtained from the SGC's official website, along with academic articles, books, and relevant online resources. The data collected from these sources were systematically analyzed to identify key internal and external factors influencing the project. Initially, the gathered information was structured within the SWOT framework to assess the project's strengths, weaknesses, opportunities, and threats. Based on the findings, strategic recommendations were developed to enhance the SGC's operational and strategic effectiveness.

The main population of interest consists of approximately 20 energy companies involved in the SGC initiative. This initiative is of significant importance for Azerbaijan, Georgia, Turkey, Greece, Albania, and Italy, as the SGC passes through their territories. The projects belonging to the SGC initiative constitute the main population, which includes the Shah Deniz 1 and 2, SCP, TANAP, and TAP projects.

6. Results and Discussion

The findings of the research indicate that the initiative, which affects a wide geographic area, incorporates significant strategies to be followed. This also means that the impact of SGC will be further enhanced with the identification of effective strategies.

The presentation of the SWOT technique implementation methodology is the result of the study of various sources, such as strategic management, diagnostic analysis, and business management. Here, the strengths, weaknesses, opportunities, and threats of the project are revealed as follows:

Table 1: SWOT Analysis of SGC

Strengths	Weaknesses
Ensures contract security and supply reliability	Long-distance (3,600 km) pipeline increases technical risks
Diversifies energy sources	Lack of long-term strategy due to price fluctuations
Reduces dependency on Russian gas	Uncertainty about competition with Russian gas
Reduces energy price volatility	Political sensitivity of transit countries affects decision-making
stable natural gas flow for multiple countries	Limited EU interest due to Azerbaijan-Turkey partnership
High-capacity infrastructure with potential for expansion	Organizational decisions influenced by transit countries
Opportunities	Threats
Russia-Ukraine war increases EU demand for SGC	Geopolitical instability in transit countries
Capacity expansion with Turkmenistan, Iran,	Competition with Russian gas and LNG alternatives
Turkmenistan gas transfer enhances project scope	EU's growing focus on hydrogen and alternative energy sources
EU's growing energy security needs	Uncertainty over Turkmenistan's inclusion
EU's push for renewable energy transition may encourage hybrid projects	Russian gas limiting project growth
Potential role in future hydrogen transport infrastructure	EU's growing focus on hydrogen and alternative energy sources

The Southern Gas Corridor (SGC) prestrategic advantages, particularly energy security and ensuring contract reliability for multiple European countries. One of its key strengths is its ability to diversify energy sources, reducing the region's dependency on Russian gas and mitigating energy price volatility (Tagliapietra, 2023). Additionally, its high-capacity infrastructure offers opportunities for future expansion including more suppliers, such as Turkmenistan and Iraq (Hao et al., 2017). By providing a stable and uninterrupted natural gas flow, the SGC strengthens regional cooperation and contributes to the overall resilience of European energy markets. These strategic advantages position the SGC as a critical energy corridor, ensuring a more balanced and diversified energy mix for Europe.

Despite its strengths, the SGC also faces notable challenges that could limit its long-term impact. The pipeline's extensive 3,600 km length introduces technical risks and increases operational and maintenance costs, which may affect its economic viability. Additionally, political sensitivity in transit countries such as Turkey and Azerbaijan creates uncertainty in decision-making, particularly

in securing long-term agreements with EU stakeholders (Koukoudakis, 2017). Another significant weakness is the uncertainty surrounding competition with Russian gas, as the EU's future energy policies may prioritize alternative supply routes or LNG imports (Pach-Gurgul, 2023). Furthermore, organizational decisions within the SGC project are heavily influenced by the political and regulatory landscape of transit countries, potentially reducing its operational flexibility. Addressing these weaknesses through policy alignment, infrastructure modernization, and diplomatic engagement will be crucial for SGC's sustained success.

The Southern Gas Corridor (SGC) presents several strategic opportunities that can enhance its role in European energy security. The Russia-Ukraine war has accelerated the European Union's (EU) diversification efforts, increasing demand for alternative supply routes like the Southern Gas Corridor SGC (Siddi, 2019). Additionally, the project has significant expansion potential with the inclusion of natural gas reserves from Turkmenistan, Iran, and the Eastern Mediterranean, which would strengthen regional energy security and diversify supply sources. The potential transfer of Turkmenistan's gas would not only broaden the project's scope but also reinforce Azerbaijan's position as a key energy supplier (Tagliapietra, 2023). Moreover, the EU's increasing energy security concerns create an opportunity for the SGC to solidify its role as a long-term and reliable gas provider. Furthermore, the EU's push for renewable energy and decarbonization may encourage hybrid projects, integrating natural gas infrastructure with emerging clean energy solutions such as hydrogen transport (Stevenson & Roberts, 2022). This potential transition could allow the SGC to evolve into a flexible energy corridor that aligns with future sustainability goals.

Despite these opportunities, the project faces significant threats that could impact its long-term viability. Geopolitical instability in transit countries remains a major risk, as political conflicts and regulatory uncertainties can disrupt operations and deter investment. Additionally, the SGC must compete with Russian gas and liquefied natural gas (LNG) alternatives, which could limit its market share and profitability (Chyong and Henderson, 2023). The EU's increasing focus on hydrogen and alternative energy sources poses another challenge, as long-term policy shifts may reduce reliance on natural gas in favor of more sustainable options (Stevenson & Roberts, 2022). Furthermore, uncertainty surrounding Turkmenistan's participation in the project raises concerns about securing additional gas supplies, potentially weakening the SGC's expansion plans (Tagliapietra, 2023). Lastly, Russian energy policies and market strategies continue to influence the region, posing a risk to SGC's growth and long-term competitiveness. Addressing these threats will require strategic policy adjustments, investment in new energy infrastructure, and diplomatic efforts to ensure the corridor remains a vital component of Europe's energy security landscape.

By implementing carbon capture and storage (CCS) technologies and leveraging EU funding for hydrogen projects, the Southern Gas Corridor (SGC) can evolve from a fossil fuel-focused corridor into a key facilitator of the EU's clean energy transition. The role of CCS in decarbonizing hydrogen production is widely recognized, with studies highlighting its importance in enabling low-carbon hydrogen production while utilizing existing gas infrastructure (Mohammed et al., 2024). Additionally, the European Hydrogen Backbone initiative and other EU policies aim to retrofit natural gas pipelines for hydrogen transport, which can help integrate the SGC into Europe's hydrogen network (Trincone, 2024). Leveraging EU funding mechanisms such as the Innovation Fund and REPowerEU Plan further supports infrastructure investments for hydrogen compatibility, ensuring the long-term sustainability of the corridor (Fuel Cells Bulletin, 2019). This transition would not only support the EU's decarbonization targets but also position the SGC as a strategic energy corridor for renewable hydrogen transport.

As a result of the analysis of threats, defense, strengths, and weaknesses of the SGC project, the following strategic goals and actions can be formulated:

Diversification strategy

The diversification strategy involves increasing the gas supply from the project and transferring more natural gas through the pipeline, which is indeed an important element in strategic planning. Given the ongoing Russia-Ukraine conflict and the increasing natural gas demand in the EU, the SGC Project can play a significant role in meeting these demands.

The gas volumes, currently at 16 billion cubic meters, can be further increased by the participation of production enterprises owned by project stakeholders and the inclusion of Turkmenistan's natural gas output in the project. This expansion can enhance the project's capacity to meet the growing energy needs of the region and contribute to diversifying the natural gas sources for the EU.

By expanding the natural gas volumes transferred through the pipeline, the SGC Project can provide a more reliable and diversified energy supply to the European market. However, while the energy dimensions in the region remain the same, the value is consistently increasing. Meanwhile, the rate continues to rise. It is possible to increase the total capacity of the SGC project to either 23 billion cubic meters or 31 billion cubic meters in the next design phase. In addition, 31 billion cubic meters of additional natural gas from Turkmenistan can be transported via the SGC Project (Shokri Kalehsar, 2021a).

Diversification and dissemination of products related to commercial transactions

Diversification and expansion of commercial products and transactions are indeed important strategies for the project partners involved in the natural gas transfer. By collaborating internationally, the countries participating in the project can jointly supply natural gas and strengthen their domestic supply capabilities.

Through this international cooperation, the project partners can enter new markets and expand their commercial products related to natural gas. By doing so, they can attract new subscribers and increase their customer base. Additionally, entering new markets allows them to increase natural gas supply, meeting the growing demands of these markets.

This strategy of expanding market presence and increasing supply contributes to the overall success of the project and enhances the economic benefits for the participating countries. It enables them to leverage their natural gas resources and create mutually beneficial commercial relationships, ensuring a more sustainable and diversified energy market.

Product diversification

Product diversification can be achieved through the SGC project. Road Energy, a new generation energy within the scope of the zero emission strategy in 2050, can be transferred from this line. Product diversification within the Southern Gas Corridor (SGC) project presents a significant opportunity to align with the EU's long-term decarbonization goals. In addition to natural gas transport, the corridor can be adapted to facilitate hydrogen transportation, a key component of the EU's zero-emission strategy for 2050. Retrofitting existing pipelines for hydrogen transport is being explored under initiatives such as the European Hydrogen Backbone (EHB), which aims to establish a pan-European hydrogen infrastructure (Trincone, 2024).

The integration of renewable hydrogen into the SGC aligns with the European Green Deal and REPowerEU plan, ensuring energy security while promoting low-carbon energy alternatives (Fuel Cells Bulletin, 2019). The corridor could serve as a vital link between hydrogen-producing regions, such as Azerbaijan's emerging renewable energy sector, and European markets demanding clean energy solutions. Additionally, new technologies, including carbon capture and storage (CCS), can further enhance the viability of blue hydrogen transport, reducing emissions from the existing natural gas supply chain (Mohammed et al., 2024). The inclusion of hydrogen transport in the SGC framework ensures not only product diversification but also the corridor's long-term sustainability as an energy transit route in the EU's evolving energy landscape.

More active marketing

With these final investments, it is possible to develop a marketing strategy that is more internationally influential, to further expand the image of the SGC project. With this strategy, it may be possible to fill a part of the market share, emptied from Russia, with the SGC project. The Russia-Ukraine war has disrupted Russian gas supplies to Europe, creating a market gap that the Southern Gas Corridor (SGC) can strategically fill. Under the REPowerEU Plan, the EU seeks alternative suppliers, and targeted marketing can position the SGC as a reliable, long-term energy source. Expanding the corridor with Turkmenistan's vast gas reserves via the Trans-Caspian Pipeline (TCP) and potentially integrating Iranian gas would further enhance Europe's energy security and diversification. By strengthening its market position and promoting regional integration, the SGC can capture a significant share of the market left by Russia, reinforcing its role as a key energy corridor for Europe.

Cooperation

Cooperation is a key aspect of the SGC project, as it enables collaboration with other countries. This collaboration extends to the transfer of natural gas reserves from the Eastern Mediterranean to the EU market. Furthermore, the project facilitates the transportation of natural gas from Iraq and Iran.

Cooperation is a fundamental pillar of the Southern Gas Corridor (SGC), fostering regional partnerships and enhancing Europe's energy security. Beyond its existing supply routes, the SGC presents an opportunity to integrate new energy sources from Turkmenistan, Iraq, Iran, and the Eastern Mediterranean, further diversifying supply and reducing reliance on Russian gas. The proposed SGC could link Turkmenistan's vast gas reserves to the corridor, strengthening connectivity between Caspian and European energy markets. Additionally, natural gas from Iraq and Iran could contribute to the corridor's expansion, provided geopolitical and regulatory challenges are addressed. Enhanced cooperation among transit and supplier countries is essential to ensuring the SGC's long-term viability, enabling it to adapt to market demands and geopolitical shifts while reinforcing its role as a strategic energy corridor for Europe.

7. Conclusion

By utilizing the SWOT analysis, the research assesses the current situation of the SGC Project and identifies the key opportunities it can capitalize on, as well as the potential threats it may face. This analysis aids in formulating strategies to maximize the project's strengths and opportunities, while also addressing and mitigating its weaknesses and threats. The analysis of SGC identifies the external factors that play a vital role in the future by examining risks and fully taking advantage of future opportunities. Likewise, it creates the roadmap for the successful implementation of the program.

By utilizing SWOT analysis, this study evaluates the Southern Gas Corridor (SGC) and identifies key opportunities that can be leveraged, as well as critical threats that may hinder its long-term success. The findings indicate that SGC's strengths, such as its role in diversifying European energy supply and reducing dependency on Russian gas, position it as a strategic infrastructure project. However, its weaknesses, including high operational costs, regulatory challenges, and limited LNG integration, present risks to its long-term sustainability.

The analysis also highlights that expanding the corridor to include Turkmenistan and Iraqi gas could significantly increase capacity from 16 billion cubic meters (bcm) to over 30 bcm, strengthening EU energy security and Turkey's role as a key transit hub. Additionally, developing hydrogen transport infrastructure within SGC would align with the EU's 2050 decarbonization strategy, ensuring long-term relevance amid the shift toward renewable energy.

However, geopolitical instability in transit countries, competition from Russian gas and LNG alternatives, and evolving EU regulatory frameworks pose substantial threats. Without proactive

policy engagement and infrastructure modernization, these risks could undermine SGC's strategic objectives.

In conclusion, the SWOT analysis provides a roadmap for SGC's long-term sustainability by prioritizing diversification, infrastructure adaptation, and policy alignment. To remain competitive, the project must integrate advanced monitoring technologies, strengthen regional cooperation, and align with EU energy transition policies. By addressing these strategic priorities, the SGC can enhance its geopolitical and economic value, securing its role as a critical energy corridor for Europe's future.

AUTHORS' CONTRIBUTION

This study was conducted by a single author.

CONFLICT OF INTEREST DECLARATION

There is no financial conflict of interest, and there is no conflict of interest among the authors.

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