Revista de Științe Politice. Revue des Sciences Politiques • No. 89 • 2026: 38 - 55

ORIGINAL PAPER

Infrastructure Integration and Energy Security Governance: Observing Romania's Role in Regional Natural Gas Transport Systems

Alexandra-Ștefania Dinulescu[1)]

Abstract:
Energy infrastructure has become a principal element for contemporary governance, influencing not only market efficiency, but also national security, regional stability, and state decisions regarding foreign policy. In Europe's tensed geopolitical environment, natural gas transport systems represent long-term advantages whose political relevance goes beyond their technical purpose. This article analyzes how integration into international and regional gas transport infrastructures contributes to national and energy security, describing infrastructure connectivity as a form of governance strategy. This is done by introducing a new indicator named GTII (Gas Transport Infrastructure Integration) which will examine the degree to which states are involved in operational gas transmission systems. The indicator reveals integration as a dimension of security, explaining how diversification of partners and routing optionality can reduce exposure regarding disruptions, political pressure, or technical failure. This study will focus on Romania's participation in two major regional and international gas transport systems: the BRUA pipeline and the Trans-Balkan gas corridor. Despite their differences regarding historical origins and technical designs, both systems improve Romania's access to different supply routes and integrate the country within wider regional governance frameworks. The results reveal that Romania's integration into different operational pipeline systems reduces vulnerability to one route dependency, enhances crisis response capacity, and grows its relevance in the regional energy landscape. By applying GTII, the article assigns Romania a high level of infrastructural integration, validating the hypothesis that involvement in multiple gas transport pipelines can generate positive effects for national security. In doing so, it highlights the everlasting political importance of energy infrastructure that influences the security governance in Europe.

Keywords: *energy security; infrastructure governance; natural gas transport; national security; diversification; regional integration.*

[1)] Ph.D. Student, Bilateral Agreement for Education between Romania and Azerbaijan, Baku State University, Faculty of International Relations and Economy, Department of Diplomacy and Modern Integration Processes, International Relations Specialization, ORCID: 0009-0005-4226-3815, Phone: 040721919753, Emails: dinulescu.alexandra-shtefania@bsu.edu.az, alexandrastefaniaag7@gmail.com

Infrastructure Integration and Energy Security Governance: Observing Romania's Role in Regional Natural Gas Transport Systems

Introduction and context

In the past couple of years, energy security has resurfaced as a main concern of political sciences, public policies, and governance studies. The disruption of supply chains, geopolitical conflicts affecting the transit routes, and the increased competition for valuable resources have revealed the importance of energy infrastructure to national security and diplomatic power. As an example, the Ukraine war, which now is supposed to enter its fourth year, and the resulting energy crisis across Europe have forced countries to rethink not just where their energy comes from, but how that energy shapes their political independence. By diversifying gas imports, countries like Romania have become more involved in regional energy security initiatives. Beyond market efficiency or technical performance, the gas transport systems have become instruments of power, cooperation, and political advantage within the regional and international dimensions.

The development of new alliances, such as the 2025 Iran-Russia partnership made in order to resist the Western sanctions (APP News, 2025) offers a very important lesson for states like Romania: if you rely on a dominant energy supplier, you can become a source of political constraints. This was simply demonstrated in Belarus, which depended on Russia for over 90% of its oil and gas in the early 2000s (Kardaś & Kłysiński, 2017). So, when Gazprom cut supplies in 2004 (Konończuk, 2007: p. 3) and shut the Druzhba pipeline in 2007 (Reuters, 2008) Belarus was forced to give up the control of its energy infrastructure, fact which limited its policy autonomy. The same patterns can be noticed everywhere: Lithuania faced an extended oil cutoff after a refinery sale to Poland (JamesTown Foudnation, 2006), Ukraine suffered gas disruptions which affected the whole Europe (de Long & et Al., 2010: pp. 511-338), and Georgia and Armenia experienced unexplained pipeline failures because of different political tensions (NY Times, 2006).

All these cases prove how energy dependence and no room for optionality can create serious vulnerabilities which allow suppliers to use the infrastructure as a geopolitical tool. This is why the governance of natural gas infrastructure points to different dynamics regarding the rule of law, regional integration, and institutional coordination. Long-term investments in pipelines, compressor stations, and transmission corridors can create durable partnerships among states, can shape political behavior, and can create strategic choices over decades. Therefore, infrastructural integration can be seen not only as an engineering product, but also as a governance strategy meant to reduce exposure to threats and improve the security through route diversification and cooperation.

This article introduces The Gas Transport Infrastructure Indicator (GTII) in order to observe the infrastructural integration as a dimension of national and energy security. By analyzing this integration, a new tool meant for comparative political analysis has been discovered. The central focus is Romania because of its geographical position and the infrastructural evolution, which is a great case for examining how the involvement into multiple gas transport systems can influence security, governance ability, and regional influence.

Methodology: The building of The Gas Transport Infrastructure Indicator

The Gas Transport Infrastructure Indicator represents integration into international and regional gas transport systems. It observes how much a country is merged into international and regional gas pipeline systems to which it is connected. The

indicator only targets the energy systems, which are operational transmission systems; it does not consider the individual interconnectors, which represent the technical elements of the larger pipeline systems. Moreover, the pipeline projects that remain at the planning stage and corridor concepts composed of multiple systems will not be included.

Joining different international and regional gas transport systems lowers exposure by increasing access to other supply routes and transmission systems. Countries integrated in various pipeline systems are less vulnerable to single-route disruptions, political pressure or supply interruptions caused by technical failures or geopolitical conflicts. Gas transporting infrastructure systems require big investments and are designed to function for a long time. Therefore, such an integration creates long-lasting ties, secures energy access over time, and develops a state's ability to deal with external threats. All being said, the hypothesis is constructed on this foundation:

Hypothesis = Greater integration into international and regional gas transport infrastructure strengthens a country's access to diversified gas supplies and reduces exposure to external disruptions, thereby improving national security.

Therefore:

higher integration into international and regional gas infrastructure ⇒ better diversification and optionality of supply routes ⇒ stronger national and energy security.

Likewise, absent or limited integration into international gas transport systems grows supply insecurity, dependence, and isolation, which represents a threat to national and energy security.

The indicator is built on the following formula:

$$\mathbf{I}_{c} = \{0; 1; 2; \ldots\},$$

Where:

- *0, if country (c) is not connected to any international or regional gas pipeline;*
- *1, if country (c) is connected to one international or regional gas pipeline;*
- *2, if country (c) is connected to two or more international or regional gas pipelines,*

And *(c)* $\in \{Romania\}$

Interpretation:

- *Value 0 – exclusion, marginality, no integration*
- *Value 1 – most common level of integration*
- *Value 2 – high level of integration, the state has a central role*

Natural gas transport infrastructure is delicate and corridor based. It is characterized by high irreversible costs and long operational duration, as they are built in such way to last and remain functional for several decades and they usually continue to operate very well beyond their initial design life through maintenance and modernization. Therefore, the number of international and regional pipeline systems to which a country is connected represents the portrait of its structural integration within the bigger gas transport networks.

For many countries, the usual value for this indicator is 1. This means that these states are integrated in a single major international pipeline system, either as an importer, exporter, or transit state. However, a value of 2 represents a higher level of integration, which reveals that the country is participating in multiple pipeline systems and has a more significant position within the regional gas transport structures. On the other hand, a value of 0 signals the absence of physical integration into international and regional gas transport systems. Thus, Indicator GTII expresses a different dimension of national and energy security: connecting to different gas transport infrastructures can enable diversification and long-term supply stability.

Romania is a suitable state for observing its integration into international and regional gas transport systems because of its geographic position at the crossway of Central, Eastern, and South-Eastern Europe, plus because of its features as a small-medium energy state. Not having the capacity to influence regional markets on its own, Romania's national and energy security relies on its ability to insert itself within larger regional transmission infrastructures that can eliminate exposure to supply breakdowns, external constraint and geopolitical tensions. As Romania is both a gas producer and a transit state, it is incorporated in transnational transport infrastructures that connect regional markets and allow access to various supply routes.

Case study: Romania's Integration into Regional Gas Transport Systems

Energy infrastructure plays a dual role in today's governance. On one hand, it supports economic prosperity and market functionality; on the other hand, it represents an important advantage that shapes national security and offers foreign policy options. Gas transport systems are characterized by high capital intensity, durability, and corridor-based structures which introduce political relations into physical structures, which construct the concept of energy security. This term has been mentioned more and more in the security and political studies as an important element of state power and governance. From this perspective, taking part in multiple international and regional gas transport systems can reduce dependencies on single corridors and suppliers. This diversification grows optionality, limits exposure to political pressure, and improves the capacity of states to respond and act fast to any technical failures or geopolitical cutoffs.

Using the same logic, isolation, or low integration will only grow the vulnerabilities, reinforce dependency, and reduce the state's autonomy. Therefore, over the past two decades, the energy security has become very involved in the international security research, where scholars have also been supporting this connection between supply vulnerability and national stability, geopolitical power and regional order (Novikau, 2023: pp. 35-37). This evolution captures a great transformation in understanding the energy systems: they are now also political structures who can influence a state's behavior, alliance patterns, and crisis responses. However, more research on gas transit security argues that hydrocarbons can be valuable only through secure transportation, which highlights how important the pipelines are (Ediger, Bowler et Al., 2020: pp. 88-91). They are networks that can be described as the connection of geography, power, and governance, which can reveal a state's predisposition to political pressure and supply disruptions in time. In order to fight this inclination, policy research notes that access to different routes and supplies increases optionality, which helps the state fight against the hostile pressures, technical failures, and disruptions (Pascual & Zambetakis, 2016: pp. 9-17). Through this literature, the premise that infrastructural integration should be seen as a measurable tool of national and energy security is validated. Therefore, the

use of this article's indicator GTII can capture how physical pipeline connectivity contributes to governance power and regional stability.

Applying GTII to Romania provides an evaluation of how infrastructural integration contributes to a powerful structure by reducing dependence on single corridors and improving access to other supply routes.

The following part will focus on Romania's participation in operational international and regional gas pipeline systems and observes the effects of this integration for diversification, power, and long-term supply security.

Fig. 1. Map showing Romania's integration into international and regional natural gas transport systems

Source: European Network of Transmission System Operators for Gas and Gas Infrastructure Europe (2025) „System Capacity Map", annotated by author.
Note: Original map sourced from ENTSOG-GIE (2025). The BRUA (red) and Trans-Balkan (green) gas pipeline systems are highlighted by the author. Only operational, international, and regional gas pipeline systems are considered. Projects, corridor concepts, and bilateral interconnectors are excluded.

The presented map shows Romania's integration into international and regional natural gas transport systems. Looking only at the functioning gas transport infrastructure, Romania is connected to two different gas pipeline systems: the BRUA pipeline and the Trans-Balkan one. They are separate with different geographic purposes and security functions, introducing Romania within the regional and international gas transport networks.

The BRUA pipeline system was initially planned as a multi-state transmission project bringing together Bulgaria, Romania, Hungary and Austria, with the main purpose of improving gas connectivity between Southern-Eastern and Central Europe and allowing access to diversified supply sources, including the Black Sea region: „proposed project on the Romanian territory would allow access to the future major gas infrastructure projects such as TAP, gas sources from Central European gas hubs and potential gas transportation from Black Sea deposits" (European Bank for Reconstruction and Development, n.d.). In its complete design, BRUA was described as „part of the European Commission's Projects of Common Interest, with approximate total length of 1,318km" (European Bank for Reconstruction and Development, n.d.) and was supposed to link Romania's transport infrastructure to the Central European gas hub at Baumgarten in Austria, therefore increasing Romania's influence as a key transit within the bigger European gas transport framework. However, even though Austria is part of the integral BRUA concept, the project so far is functioning only along the Bulgaria-Romania-Hungary line, as the extension to Austria has not been implemented yet and the Romania-Hungary path is not working at full capacity as the Phase II is not completed. Despite these, the operational configuration is still enough to categorize BRUA in this study as a regional gas pipeline system which integrates Romania within its regional gas networks.

Observing BRUA on Romanian territory, it mostly relies on the already existing national gas transporting infrastructure operated by Transgaz and it is complemented by specific upgrades and compressor installations developed under the BRUA project framework. Therefore, the operational BRUA pipeline enters in Romania from Ruse, Bulgaria at the Giurgiu interconnection point, then crosses the southern and central transmission bases through the Bucharest transmission hub and continues towards the Podișor main compression hub to Recaș, which is the junction node. From there, gas goes to the western transmission corridor to Horia, where Romania interconnects with Hungary at Csanádpalota. In this way, Romania is able to participate in the transnational gas flows with both Bulgaria and Hungary.

The whole BRUA project included different development phases at both national and regional level: „development on the territory of Romania of the National Gas Transmission System along the corridor Bulgaria-Romania-Hungary-Austria (BRUA Phase 1 and 2) and Enhancement of the bidirectional gas transmission corridor Bulgaria-Romania-Hungary-Austria (BRUA Phase 3) and the Development on the territory of Romania of the Southern Gas Transmission Corridor for taking over gas from the Black Sea shore (Black Sea-Podișor)" (Three Seas Project, n.d.). Of all these three phases, only Phase I have been achieved, and it is now fully operational. This phase focused on three compression stations, such as SC Podișor, SC Bibești, and SC Jupa, where „each hub is being equipped with two compression units (one in operation and one on standby), capable of ensuring bidirectional gas flow" (SC Natural Net SRL, Transgaz S.A., European Investment Bank et Al., 2021: p. 21) and the construction of Podișor-Recaș pipeline of 479km. Since Romania already had the Ruse-Giurgiu interconnector for Bulgaria and the Horia-Csanádpalota for Hungary, with the achievement of the Phase I BRUA pipeline and upgrades, the state can now support gas flows from both Bulgaria and Hungary into Romania, as well as from Romania toward its neighboring markets.

The Podișor-Recaș pipeline is an important, multi-facility transmission line of 479km. The three main compression hubs (circles) „with an installed power between 9 and 13.8 MW" (Three Seas Project, n.d.) can be observed: GCS Podișor, which is the principal injection and system center station. It receives gas from Bulgaria through the

Giurgiu interconnector and helps with the initial compression to launch the gas into the transmission system, GCS Bibești is the middle line compression hub, and it is specially placed to boost gas pressure after the initial approximate 200km segment, making sure that there is sufficient pressure for the remaining path to Recaș. Its location around Hurezani means that it has multiple purposes: besides repressuring gas from Podișor, it can also inject locally produced gas from the Hurezani fields into the national transmission system. The last one is the GCS Jupa and it is the second regulating hub for the final leg. Since it is located right before the terminus, it makes sure that gas arrives at Recaș with the correct pressure and volume for further distribution. Intermediate facilities are indicated as squares (Zătreni and Pui). However, Hurezani is also categorized as a facility since „The water requirements to Bibesti GCS will be satisfied though the connection to the existing water supply network from Hurezani and will be used for firefighting, hygiene and consumption" (Evans, 2017). The Zătreni storage site is mostly attributed to LOT 1 and 2 regarding construction, maintenance and modernization. Same chores for the Pui one, but it corresponds to LOT 3. The terminus or junction point is Recaș (the triangle), and it represents the point where the gas is measured and distributed to the next operatora for transit into Hungary, Csanádpalota. However, the absence of Phase II capacity developments restrains the scale of these flows.

Phase II was basically designed to increase the transport capacity towards Hungary and beyond, allowing large-volume exports, including potential gas coming from the Black Sea. This consisted of building a new Recaș-Horia pipeline of approximately 50 km and the expansion of the already mentioned three compression stations by installing an extra compression unit in each station, plus the modernization of the gas station GM Horia, according to sources (SC Natural Net SRL, Transgaz S.A., European Investment Bank et Al., 2021). However, in 2019 it was announced that this phase has been postponed because of „the negative results from the economic capacity test held by Transgaz and their Hungarian partner FGSZ" (Bulgartransgaz EAD Management Board Meeting Report, 2019). The results showed „the fact that none of the companies who took part in the exploration and production activities in the Black Sea (OMV Petrom, Exxon Mobil, Lukoil, BSOG) have officially said that they will start with the production" (Bulgartransgaz EAD Management Board Meeting Report, 2019). Therefore, this constrained Romania's ability to be a high-volume regional supplier, even though physical and technical bidirectionality exists. That's why nowadays BRUA works more as an enhancement for optionality and security, rather than a full-scale export route.

Phase III of the project is more about improving Romania's national transmission capacity and integrating offshore production into the BRUA system by enhancing „the Romanian transmission system between Onesti- Isaccea and reverse flow at Isaccea, [...] the Romanian transmission system between Onesti- Nadlac" (Three Seas Project, n.d.) and extending the „Romanian transmission system for taking over gas from Black Sea shore" (Three Seas Project, n.d.). The Onești-Isaccea corridor already exists, that is why the official documents clearly mention that the Phase III of BRUA „does not involve the construction of new pipelines, as it is an interconnection project" (Transgaz S.A., European Investment Bank, et Al., 2021: p. 24). Instead, Phase III and other related projects are focused on working upgrades, including technical modifications that would enable West to East gas flows which would allow Romania to export gas further to Ukraine, to balance regional insufficiency, and to redirect Black Sea resources to east. One of these modifications is mentioned by official sources to be „the rehabilitation of the DN 800 pipeline from Onești to Cosmești" ((Transgaz S.A., European Investment Bank,

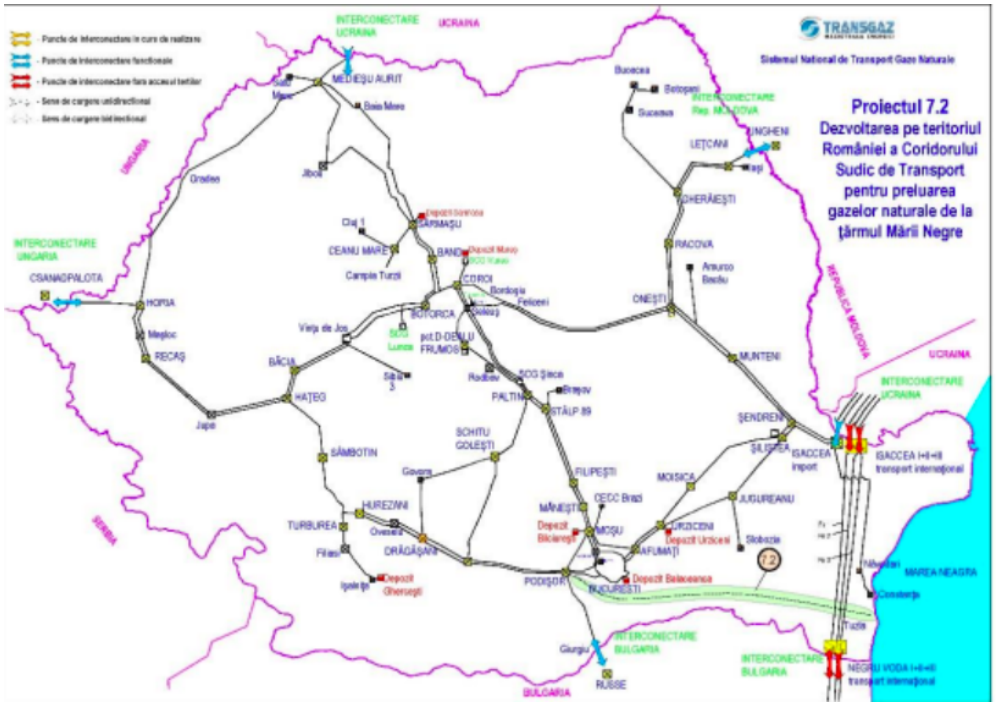
et Al., 2021: p. 24). Mainly, the purpose is to connect the markets of Bulgaria, Romania, and Ukraine and to introduce the eventual natural gas discovered in the Black Sea deeper into the Romanian transport system.

In order to take the gas and transport it from the Black Sea, the Phase III would introduce a new pipeline that will connect the Black Sea shore to Podișor which will allow to move the resources directly to the BRUA corridor: „The pipeline with a total length of approximately 308,2 km, is a telescopic pipeline made up of two sections and designed to transmit gas at a pressure of 63 bar. The two pipeline sections are:

• Section I, Black Sea shore – Amzacea, with a length of 32,5 km, will have a diameter of Ø 48" (Dn1200);

• Section II, Amzacea – Podișor, with a length of 275,7 km, will have a diameter of Ø 40" (Dn1000)" (European Network of Transmission System Operators for Gas, 2019: p. 257).

Fig. 2. Project Map: Tuzla-Podișor Offshore Gas Pipeline



Source: Original map from Transgaz PDSNT 2021-2030, SC Natural Net SRL, Pronatura Foundation and European Investment Bank
Note: The Tuzla-Podișor pipeline is highlighted with the color green.

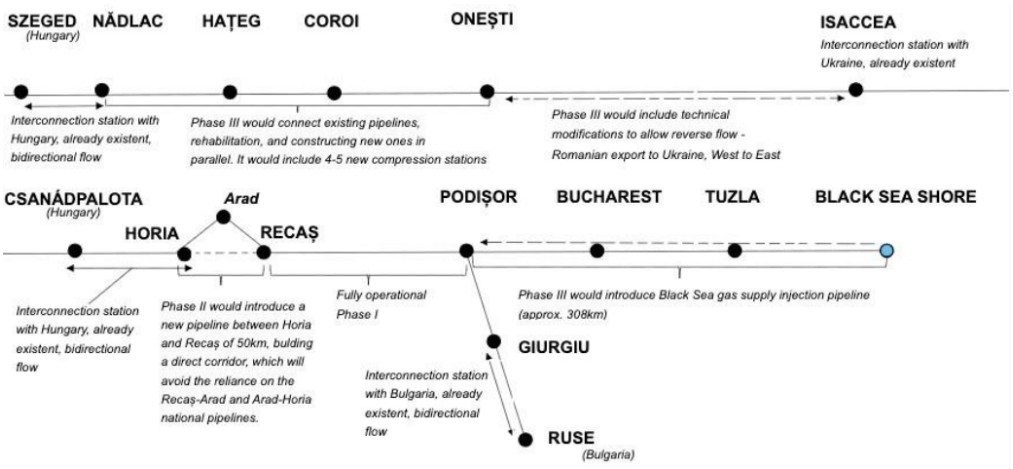
The central construction idea of BRUA Phase III depends on the main corridor plan of Onești-Coroi-Hațeg-Nădlac. The specialists note that it plans to expand the transport capacity on this already existent corridor which „functions at technical parameters that are inadequate for a mainline artery" (Transgaz S.A., European

Investment Bank et Al., (2021: p. 27). This involves a combination of different measures such as:

- the rehabilitation or replacement of some specific existent pipelines that belong to the National Transmission System and the construction of new pipelines in parallel with the existing ones, like the Băcia-Hațeg-Horia-Nădlac of approximately 280km. This is why the Onești-Nădlac system is seen as a hybrid one (it is partially reliant on existing pipelines but also on replacements and new ones constructed in parallel), totaling approx. 843km and strengthened by new compression hubs;
- the construction of „four or five new compressor stations with a total installed power of approximately 66-82.5MW" ((Transgaz S.A., European Investment Bank et Al., (2021: p. 27);
- increasing the national gas transport capacity to Hungary by „4.4 billion cubic meters per year" (Transgaz S.A., European Investment Bank et Al., (2021: p. 27).

Moreover, at its western end the corridor ends at Nădlac, which is already connected to Hungary through the Nădlac-Szeged interconnector. So, through Phase III, the amount of gas that would reach there will be increased and connected next to the Tuzla-Podișor project.

Fig. 3. BRUA Corridor and Development Plan: All Three Phases, Reverse Flow, and Black Sea Supply



Source: Author's compilation based on information from SC Natural Net SRL, Transgaz S.A., Pronatura Foundation, European Investment Bank (2021).
Note: The scheme portrays all BRUA gas transmission phases in Romania, distinguishing between operational infrastructure (solid lines) and planned or postponed elements (interrupted lines). Phase I is complete and operational, connecting Bulgaria to Hungary through the Giurgiu-Podișor-Recaș corridor, using existing national pipelines between Recaș-Arad and Arad-Horia to reach Horia-Csanádpalota interconnector. The interrupted Recaș-Horia line represents the postponed Phase II which was intended to create a direct high volume capacity export corridor toward Hungary. Phase III is

illustrated through the system modifications along the Onești-Coroi-Hațeg-Nădlac path which will be rehabilitated and enhanced with new parallel segments and compression stations, as well through the introduction of a Black Sea gas supply injection pipeline (Tuzla-Podișor) and the reverse flow capability at the Isaccea interconnection point with Ukraine. Dots stand for interconnectors, compression stations and junction nodes, while the double arrowed lines represent bidirectional flow ability. For more functional specifications, consult the official technical documentation from SNTGN Transgaz S.A.

All said, BRUA is an important structural upgrade for Romania because it was designed as a multi-phase regional corridor which is supposed to link Romania, Bulgaria, Hungary and Austria. Through this, the regional connectivity is strengthened, bidirectional flows are functioning, and Romania will be more involved in the Central and South-Eastern European gas markets. Even though, only Phase I is working, as it has been shown above, BRUA has already influenced Romania's position within the regional gas transport systems.

Regarding national and energy security terms, BRUA's meaning is less about current export capacity and more about its role in improving the state's ability to defend itself and recover from challenges. BRUA helps reducing Romania's dependence on single-direction corridors and allows better access to different regional systems. Therefore, it acts as a shield against all the threats presented in this study: technical failures, political pressure, and supply disruptions. Moreover, the project will improve the capacity of absorbing future gas sources, including offshore Black Sea production, once upstream conditions will be available. Its impact will be amplified by the soon start of offshore production from the Neptun Deep gas field in Romania, which is „expected to produce 8 bcm/y of natural gas in the first 10 years of its operation" (European Commission, Staff Working Document No. SWD 830 final 2025: p. 17) from 2027, offering „another important source of diversification for the Member States in the region" (European Commission, Staff Working Document No. SWD 830 final 2025: p. 28). So, most probably the need to use these major internal resources and transport them into regional markets will push for the completion of BRUA's Phase II and III, which will become beneficial and very necessary.

In conclusion, BRUA improves diversification, optionality, and helps ensure long-term supply stability. Even in its incomplete form, the project supports the logic of Hypothesis 1. This is why BRUA should not be understood only as an important project, but as a tactical advantage with lasting effects for Romania's energy security and its higher national security posture, as Romanian ex-president Klaus W. Iohannis was explaining in 2020: „The development of the National Gas Transmission System along the BRUA corridor is an essential stage in strengthening the energy security of both our country and the European Union, but also the energy security of the Black Sea region" (CE Energy News, 2020). Moreover, he further offered a future visualization of this: „through the connection of BRUA to the Vertical Corridor, through the materialization of the Black Sea offshore exploitations, which we hope to start as soon as possible, Romania has real assets to become an important player in the regional gas market. To this effect, I am firmly convinced that the funds invested in the gas transmission infrastructure will generate more for Romania than a competitive positioning on the relevant markets or a reassertion of our country's trustworthiness as a model partner in increasing energy security throughout the region" (CE Energy News, 2020).

The second operational international gas transport system integrating Romania into regional and international gas structures is the Trans-Balkan gas pipeline. Unlike BRUA which was imagined from the beginning as a regional pipeline with the task of diversification, bidirectional flows, and market integration, the Trans-Balkan pipeline was originally designed as a large-scale, corridor-based export system. Its history, scale, and corridor logic validate it as a distinct regional gas transport system under the assumptions of Indicator GTII.

The TBP system was thought and constructed during the former Soviet Union era and was completed in 1988. Its main purpose was to „to transport Russian gas through Ukraine (using the ATI, RI and ShDKRI pipeline systems) to supply Moldova, Romania, Bulgaria and Turkey with natural gas ("forward flow")" (EU Energy Community Secretariat & WECOM, 2024: p. 5). In time, the importance of the TBP declined because of multiple reasons: „diversification of supply routes for Turkey and the ramp-up of domestic natural gas production in Romania.

At the beginning of 2020 TurkStream - another subsea pipeline from Russia to Turkey - was commissioned, directly supplying Turkey (line 1) and creating a new Russian supply route to central Europe (line 2) via Bulgaria and Serbia towards Hungary" (EU Energy Community Secretariat & WECOM, 2024: p. 5). Therefore, now it is mostly used to cover Moldova's natural gas consumption estimated at nearly 2-3 bcm per year (EU Energy Community Secretariat & WECOM, 2024: p. 5), and as limited supplies „to Ukrainian final consumers in the Căușeni-Orlivka section (below 0,5 bcm/a)" (EU Energy Community Secretariat & WECOM, 2024: p. 5).

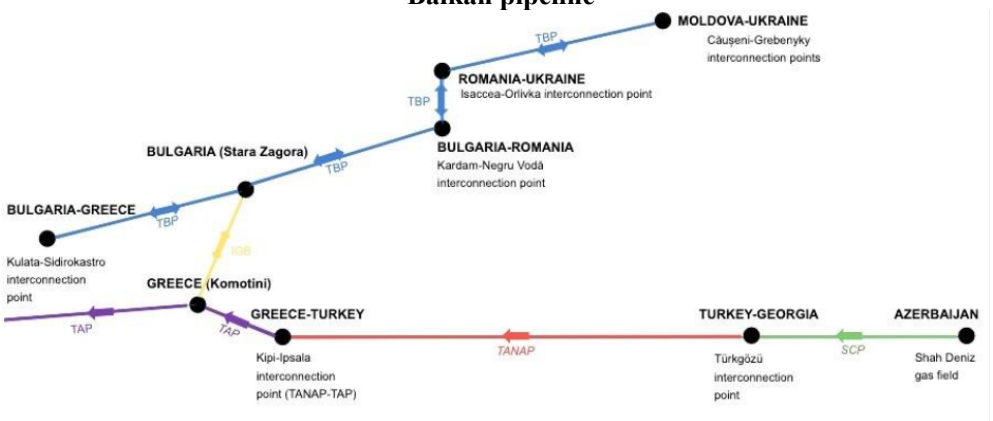
Currently, the TBP runs from Greece to Bulgaria, Romania, Moldova and into Ukraine, crossing interconnected national gas transmission systems. Modern use of the corridor depends on the coordination between the national transmission system operators, which are the ones responsible for operating high-pressure gas transmission networks. Moreover, they develop together the products' capacity and tariffs, allowing gas shippers to reserve transport capacity along the entire corridor through the Regional Booking Platform.

In its classic structure, the TransBalkan pipeline historically transported Russian gas to south. However, actual evidence shows that the corridor is no longer used regularly for Russian exports as „the long-term transit contract expired on 31 December 2024, halting all transit of Russian gas via Ukraine to EU countries and Moldova" (Astrov & Weiss, 2025: p. 12), and Gazprom did not reserve capacity at the TransBalkan route for deliveries in the beginning of 2025 (Ministry of Energy of the Republic of Moldova, 2025). So, the route is now repurposed for diversification and new supply partnerships with Azerbaijan and European sources, rather than being a channel for Russian supplies. Already steps to achieve this have been taken as for august 2025, approximately 20% of the available corridor's capacity was booked in an online booking platform auction, which is an increase comparing it to the last periods (Az News, 2025). Moreover, the capacity products were designed to reduce costs and develop the supply access toward Ukraine. As reported, auction products lowered gas transportation costs by about 25%, which helped the TransBalkan corridor to be commercially more active (Ministry of Energy of Ukraine, 2025). It is also stated that „Ukraine increased booking capacity of the Trans-Balkan route by 2.6 times" (Ministry of Energy of Ukraine, 2025), meaning that the market interest is growing regarding the use of the corridor to access southern supply sources and manage storage operations in Ukrainian facilities.

Regarding these, Romania is also supporting it as it has reduced the gas transit tariff for Ukraine via Trans-Balkan route by 50% (Logos Press, 2025). This comes as a part of a project that unites all the regional regulatory bodies in order to guarantee stable supplies and security, demonstrating that efforts are made for re-establishing and advancing corridor usage ahead of winter demand periods, especially with the disruptions in Ukraine's internal gas production and infrastructure. This move toward diversified supplies was even more possible with Azerbaijan's help through a recent, historical agreement for Ukraine who signed its first natural gas import deal with SOCAR via the Trans-Balkan in July 2025 (Reuters, 2025). Even though at first, they were pilot shipments described as small volume, they are now very meaningful, as Azerbaijani gas can reach the Bulgaria-Romania-Ukraine path. This is even confirmed by Ukrainian officials who described it as „a strategically important step that paves the way for long-term cooperation. It is also another example of diversifying supply sources and strengthening Ukraine's energy security" (United 24 Media, 2025). Additionally, since the tariff modifications made the corridor economically possible, Ukraine announced its plans to resume the Trans-Balkan imports.

Currently, as of early 2026, the Trans-Balkan corridor has moved beyond the pilot use, and it is now an important element of Ukraine's gas import strategy. It is confirmed that the state indeed resumed the regular gas imports through the corridor and that it is used to bring gas from Greece, including liquified natural gas-linked supplies, as the state wants to balance the infrastructure damage and to boost the winter energy security. At the same time, Azerbaijan reassured that the cooperation „would not be derailed" (Reuters, 2025) as SOCAR launched „natural gas supplies to Germany and Austria" (Reuters, 2026) as well in January 2026. This proves that Azerbaijan is growing importance in Europe's gas supply scenery and that it is a reliable partner, ready to commit to a long-term partnership, despite the global challenges.

Fig. 4. Pipeline Connectivity between Southern Gas Corridor and the Trans-Balkan pipeline



Legend	
Green line SCP	*South Caucasus Pipeline which transports natural gas from Azerbaijan through Georgia to Turkey.*
Red line TANAP	*Trans-Anatolian Natural Gas Pipeline which carries the Azerbaijani gas across Turkey from Türkgözü to the Greece–Turkey border at Ipsala.*
Purple line TAP	*Trans-Adriatic Pipeline which transports the gas from the GreeceTurkey interconnection point at Kipoi westward across Greece and onward to European markets.*
Yellow line IGB	*Interconnector Greece-Bulgaria. It connects Komotini to Stara Zagora allowing the transfer gas from TAP and the Greek transmission system into Bulgaria.*
Blue line TBP	*Trans-Balkan Pipeline. Bidirectional pipeline system which connects Greece, Bulgaria, Romania, Ukraine and Moldova.*
↔	*Bidirectional gas flow. Arrows do not represent actual flow volumes or contractual directions.*
⬅	*Indicative direction of gas flow. Arrows do not represent actual flow volumes or contractual directions.*

Source: Author's compilation based on ENTSOG's (2020) TYNDP Map.
Note: The figure is for schematic purposes only, and it shows the main pipelines and interconnectors following the path of Azerbaijani gas from the Shah Deniz field through the Southern Gas Corridor (SCP, TANAP, TAP), its entry into Greece at the Kipoi-Ipsala interconnector path and the next routing through the interconnector (IGB) Greece-Bulgaria or through the Kulata-Sidirokastro entry into the Trans-Balkan system (Kulata-Stara Zagora-Kardam-Negru Vodă-Isaccea-Orlivka-Căușeni-Grebenyky).

The reinvention of the Trans-Balkan pipeline is also leaving a mark on Romania's energy and national security status because it is improving the state's position as a central regional actor in the Southeastern and Eastern Europe. Romania's location in the corridor is essential especially at the Isaccea-Orlivka because the gas flows coming from Greece and Bulgaria can reach Moldova and Ukraine with Romania's help. Therefore, Romania has the dual role of a central transit actor and a connectivity hub along the south-north part of the Trans-Balkan corridor which offers the state growing relevance regarding the regional gas logistics and the decision-making. Beyond geography, the credibility and influence of Romania have also been strengthened by its implication in the policy making. Through transit tariff reductions, participation in organized regulatory initiatives, and support for integrated corridor products, Romania contributed as well to making the corridor economically possible. These measures helped the gas imports for Ukraine and Moldova and made the transnational cooperation stronger, proving that Romania is a reliable parter who can align its national interests with the objectives of the region regarding energy security.

Conclusion and discussion: Calculating the GTII for Romania and How Infrastructure Integration is a Governance Advantage

Analyzing the corridor through the national security perspective, the Trans-Balkan pipeline has evolved into an asset that guides Romania's influence beyond its borders. It helps its vulnerable neighbors to secure the energy flows, and it represents the stabilizer for the EU and NATO eastern flank, eliminating the risks that could otherwise generate secondary effects for the economy and security. Therefore, Romania has one of the most important roles as a regional energy hub which automatically improves its own national security by increasing its bargaining power, deepening its collaboration with the partner states and integrating the infrastructure within the cooperative bodies that enhance the durability and defense. Moreover, this participation also promotes the long-term diversification and shock resistance, as the Trans-Balkan pipeline is changing from a legacy export route into a multi-source system. This means that Romania will also have a new way of improving its capacity of managing the crisis situations during the high demand periods or regional disruptions.

Applying GTII to Romania results in a value of 2, proving a high level of integration into the international and regional gas transport system. Romania is strongly inserted in more than one operational pipeline system of regional relevance, most notably the ones presented in this study: the BRUA pipeline and the Trans-Balkan gas pipeline system. Both of them function as different international transmission infrastructures, rather than isolated interconnectors. Through these systems, Romania is integrated at the same time into the Central European, Southeastern European and Eastern European gas transport networks, improving its security position and successfully fulfilling the criteria for the high indicator value:

$$I_{Romania} = 2$$

As explained above, this level of integration reduces Romania's exposure to single-route cutoffs and improves its access to diversified supply sources. It benefits from routing flexibility, bidirectional flows, and different entry points, including access to resources from the Southern Gas Corridor, LNG-related supplies entering through Greece, and regional steady flows to Ukraine and Moldova. Regarding the indicator logic, such value represents a stronger optionality and lowers the vulnerability to geopolitical

pressure, technical failure, or individual supply interruptions. In line with the hypothesis of the indicator GTII, Romania's higher level of integration into international and regional gas transport infrastructure supports the national and energy security and validates the state's central and growing influential role within its region.

The results of this Indicator confirm the hypothesis. Romania's participation into these two gas transport systems strengthen its national and energy security by integrating it into a cooperative regional framework. Beyond just the technical capacity, this involvement enhances political credibility, geopolitical relevance, bargaining power, and crisis management abilities. From a political science point of view, the infrastructure integration comes as a form of structural power. So, it allows the state to create regional stability, to support partners during crises, and to align its national interests with the bigger regional objectives.

The findings reveal also Romania's role as a great regional stabilizer by facilitating the gas flows to Moldova and Ukraine, proving that infrastructure governance can be used for positive implications regarding the regional security. Despite its incomplete implementation, BRUA is still connecting Romania to its neighboring markets. Its operational configuration places Romania into a wider transmission framework, improving its optionality. Moreover, with the Neptun Depp project becoming operational after 2027, this will most probably mean that the postponed BRUA phases will be considered and become a reality. For Romania, this could mean great success regarding its economic and security status. Regarding Trans-Balkan Pipeline, this system has improved even more Romania's role. Now the state has a bigger obligation than just regulatory cooperation, tariff adjustments, and support for the integrated corridor products. With the new access to the Azerbaijani gas resources through the Southern Gas Corridor, Romania has the great role of supporting Moldova's and Ukraine's energy security. This central position along the corridor grows the regional relevance and strengthens its characterization as a stabilizing actor on the EU and NATO eastern flank.

In conclusion, this article has demonstrated that integration into international and regional gas transport systems represents a significant and measurable dimension for national and energy security. Even in its incomplete form, the BRUA project and the TBP support Romania's tactical position and validates the main hypothesis that higher integration leads to stronger security results. As future plans will materialize, the importance of these present infrastructures will matter even more. Therefore, energy infrastructure should be understood as a governance instrument with lasting effects for cooperation, security, and politics in Europe.

References:

Abdul N. for Azernews (2025). *20% of Trans-Balkan Gas Corridor capacity booked for August 2025*, https://www.azernews.az/business/245300.html, last accessed on the 21st of January 2026.

Astrov V., Hanzl-Weiss, D. (2025). *The European gas market: Emancipating from Rusia in Policy Notes and Reports, The Viena Institute for International Economic Studies Publishing House*, p. 12, available at: https://wiiw.ac.at/the-european-gas-market-emancipating-from-russia-dlp-7261.pdf, last accessed on the 19th of January 2026.

Bagirova, N. et al. for Reuters (2026). *Azerbaijan starts natural gas supplies to Germany and Austria*, accessible at: https://www.reuters.com/business/energy/azerbaijan-

starts-natural-gas-supplies-germany-austria-2026-01-16/, last accessed on the 22nd of January 2026.

Bulgartransgaz EAD (2019). *2019-2028 Ten-Year Network Development Plan of Bulgartrans EAD*, Management Board Meeting Report, Approved with Decision under Protocol No 345/23.04.2019, accessible at: https://bulgartransgaz.bg/files/useruploads/files/amd/tyndp%202017/TYNDP%202019-2028%20EN.pdf, last accessed on the 11th of January 2026.

CE Energy News (2020). *The Phase one of the BRUA pipeline is complete*, https://ceenergynews.com/oil-gas/the-phase-one-of-the-brua-pipeline-is-complete/, last accessed on the 16th of January 2026.

CEO of Naftogaz Group Koretskyi's, N. statement in Mykhailenko's, D. article for United 24Media (2025). *Ukraine Nears Gas Supply Deal With Azerbaijan via Trans-Balkan Corridor*, https://united24media.com/latest-news/ukraine-nears-gas-supply-deal-with-azerbaijan-via-trans-balkan-corridor-10845, last accessed on the 22nd of January 2026.

Chivers, C. J. for The New York Times (2006). *Explosions in Russia Cut Gas Pipelines to Georgia*, https://www.nytimes.com/2006/01/22/international/europe/explosions-in-russia-cut-gas-pipelines-to-georgia.html, last accessed on the 5th of April 2025.

de Jong, S., Wouters, J., & Sterkx, S. (2010). *The 2009 Russian-Ukrainian Gas Dispute: Lessons for European Energy Crisis Management after Lisbon in European Foreign Affairs Review,* Vol. 15, Kluwer Law International BV Publishing House, pp. 511-538.

Ediger, V. S., Bowlus, J. V. & Aydin M. (2020). *Geopolitics and Gas-Transit Security Through Pipelines in Regulations in the Energy Industry*, Springer Publishing House, pp. 88-91.

Energy Community Secretariat (2024). *Improvement of the commercial attractiveness of the Trans-Balkan Pipeline System: Analytical and recommendations report*, Viena: Energy Community Secretariat (EU4 Energy Governance Programme), Prepared by WECOM, p. 5.

European Bank for Reconstruction and Development (n.d.). *BRUA Pipeline – project summary document*, https://www.ebrd.com/home/work-with-us/projects/psd/49149.html#customtab-9f610af65e-item-53f5d5beaa-tab, last accessed on the 8th of January 2026.

European Commission (2025, June 17). *Assessing the impact of measures to phase out Russian gas imports and improve the monitoring of potential energy dependencies and amending,* Regulation (EU) 2017/1938, Staff Working Document No. SWD (2025) 830 final), p. 17, accessible at: https://www.eu.dk/samling/20251/kommissionsforslag/KOM(2025)0828/forslag/2149573/3042878.pdf, last accessed on the 16th of January 2026.

European Network of Transmission System Operators for Gas (2019). *Gas Regional Investment Plan Southern Corridor,* Based on ENT SOG's TYNDP 2018, Annex B, p. 257, accessible at: https://www.entsog.eu/sites/default/files/2020-06/l_entsog_SC_GRIP_2019_Annex_B_03.pdf, last accessed on the 12th of January 2026.

Evans, R. for Arcadis – Design & Consultancy for natural and built assets (2017). *Romanian Section of the BRUA Natural Gas Transmission Corridor Project – Supplementary Environmental Impact Assessment Report*, EC Harris and Hyder

Publishing House, accessible at: https://www.eib.org/attachments/registers/79726902.pdf, last accessed on the 10th of January 2026.

Isachenkov, V. for Associated Press (2025). *Russia and Iran sign a partnership treaty to deepen their ties in the face of Western sanctions*, accessible at: https://apnews.com/article/russia-putin-iran-pezeshkian-treaty-partnership-71a20990373851741d1fe76a81699036, last accessed on the 5th of April 2025.

Kardaś, S. & Kłysiński, K. (2017). *The story that never ends. A new stage in the energy dispute between Russia and Belarus*, OSW - Centre for Eastern Studies Publishing House, accessible at: https://www.osw.waw.pl/en/publikacje/osw-commentary/2017-05-17/story-never-ends-a-new-stage-energy-dispute-between-russia-and, last accessed on the 5th of April 2025.

Konończuk, W. (2007). *Belarusian Russian Energy Conflict: The Game Is Not Over*, in Fundacja Batorego Stefan Batory Foundation, Więcej niż sąsiedztwo - More than Neighbours, Analiza Policy Brief House Publishing, p. 3.

Logos Press (2025). *Moldova approved two new routes of the vertical gas corridor*, accessible at: https://logos-pres.md/en/news/moldova-approved-two-new-routes-of-the-vertical-gas-corridor/, last accessed on the 21st of January 2026.

Ministry of Energy of the Republic of Moldova (2025). *Gazprom did not make bookings on the Trans-Balkan pipeline for February to transport gas to the transmission region*, accessible at: https://energie.gov.md/en/content/gazprom-did-not-make-bookings-trans-balkan-pipeline-february-transport-gas-transnistrian, last accessed on the 19th of January 2026.

Ministry of Energy of Ukraine (2025). *Ministry of Energy: Trans-Balkan route capacity booking increased by 2.6 times*, https://www.kmu.gov.ua/en/news/minenerho-broniuvannia-potuzhnosti-transbalkanskoho-marshrutu-zbilsheno-u-26-raza, last accessed on the 21st of January 2026.

Novikau, A. (2023). *Energy Security in Security Studies: A Systematic Review of Twenty Years of Literature*, Issue 3, Vol. 17, CEIJSS Publishing House, pp. 35-37.

Pascual, C., Zambetakis, E. (2016). *From Security to Survival*, Brookings Institute Publishing House, pp. 9-17.

Pruchnicka, A., Polityuk, P. et al. for Reuters (2025). *Ukraine signs first Transbalkan gas deal with Azerbaijan's SOCAR*, https://www.reuters.com/business/energy/ukraine-signs-first-transbalkan-gas-deal-with-azerbaijans-socar-2025-07-28/, last accessed on the 22nd of January 2026.

Reuters (2008). *FACTBOX: Russian oil and gas export interruptions*, available at: https://www.reuters.com/article/world/us/factbox-russian-oil-and-gas-export-interruptions-idUSLS578972/, last accessed on the 5th of April 2025.

Reuters (2025). *Azerbaijan says energy cooperation with Ukraine won't be derailed by Russian strikes*, available at: https://www.reuters.com/business/energy/azerbaijan-says-energy-cooperation-with-ukraine-wont-be-derailed-by-russian-2025-08-10/, last accessed on the 22nd of January 2026.

SC Natural Net SRL, Pronatura Foundation, Transgaz S.A. & European Investment Bank (2021). *Studiu de Evaluare Adecvată - Planul de Dezvoltare a Sistemului Național de Transport Gaze Naturale 2021-2030*, p. 21, accessible at:

https://www.mmediu.ro/app/webroot/uploads/files/EA%20rev%202%20final.pdf, last accessed on the 8th of January 2026.

Socor, V. (2006). *Russia Oil Supplies to Lithuania Cut Off* in JamesTown Foundation, Eurasia Daily Monitor, Vol. 3, Issue 150, accessible at: https://jamestown.org/program/russian-oil-supplies-to-lithuania-cut-off/ , last accessed on the 5th of April 2025.

Three Seas Project (n.d.) *Projects - BRUA*, accessible at: https://projects.3seas.eu/projects/brua-development-on-the-territory-of-romania-of-the-national-gas-transmission-system-along-the-corridor-bulgaria-romania-hungary-austria-(brua-phase-1-and-2)-and-enhancement-of-the-bidirectional-gas-transmission-corridor-bulgaria-romania-hungary-austria-(brua-phase-3)-and-the-development-on-the-territory-of-romania-of-the-southern-gas-transmission-corridor-for-taking-over-gas-from-the-black-sea-shore-(black-sea-podisor), last accessed on the 10th of January 2026.

Article Info

Received: February 07 2026
Accepted: March 26 2026

How to cite this article:

Dinulescu, A. Ș. (2026). Infrastructure Integration and Energy Security Governance: Observing Romania's Role in Regional Natural Gas Transport Systems. *Revista de Științe Politice. Revue des Sciences Politiques,* no. 89, pp. 38-55.