

The Romanian Gas Hub in the Context of an Emerging Global Gas Market

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Abstract

Gas markets are undergoing significant changes which are triggered by general supply diversification and the accelerated growth of LNG transports, as well as the abundance of global gas resources enabled by the US shale revolution. Europe has been gradually shifting over the past 30 years its traditionally monopolistic gas markets towards full market integration in the Single Energy Market. Eastern Europe is still lagging behind these global gas trends due to poor interconnections and a high dependence on Russian gas supplies. Romania has recently discovered significant gas reserves in the Black Sea which would enable it to become a gas exporter. The build-up of the Romanian gas hub would secure a diversified gas supply for Central and South-eastern Europe. The Romanian gas hub would work as an arbitrage mechanism between gas prices of the northern corridors bringing Russian gas to Western Europe, and the prices of the new Southern Gas Corridor. This position would allow Romania to offer a price correlation to global gas markets for isolated continental countries in Central and South East Europe.

Keywords: gas hub, gas market, global gas market, gas price convergence, gas price arbitrage

JEL Classification: L110, Q43, Q480, F550, N740

1. Introduction

Natural gas is perceived today as a vital strategic resource for regional economic development, being predominantly addressed in geo-political terms. In broad public perceptions, gas is considered a prime necessity commodity, but it also plays a central role of economic or armed conflicts. Gas is sometimes perceived as a force vector in the play of great powers. This perception is determined by the structure of the markets in which the gas is traded, being in fact the expression of antagonistic bargaining positions of market participants defined by a supply monopoly. High opportunity costs and insufficient supply liquidity in many of the gas markets are the variables that tilt the balance towards a strongly politicized energy approach in some regions or geographical areas, and always in conflict zones.

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In this article we will argue that the geopolitical narrative is just a substitute for an economic monopoly situation where sellers will engage in actions aimed at consolidating control over supply routes and access to demand zones. We will continue with a comprehensive description of the historical features of gas as an economic asset as well as factors that have transformed over time the markets in which gas is traded. Emphasis will be placed on those events or processes that have led to major changes in gas market regulations and forms, such as oil crises in the second half of the 20th century, or the privatization processes launched by Margaret Thatcher in Great Britain in the late 1980s.

The European process of full integration of gas legislation, infrastructure and gas markets will also be assessed in terms of contributing to increased energy security in the European Union.

By using the comparative method of the initial and current price formation mechanisms as well as the geographic location of gas reserves, we will explain the phenomenon of integration and globalization of gas markets and define the concepts of liquid gas market, virtual hub, physical hub, network transmission and market integration. At the same time, we will present Romania's possible contributions to the new regional, European and global gas trading architecture.

2. The build-up of the first gas markets and their evolution during the twentieth century. Characteristics of integrated liquid gas markets.

The evolution of the wholesale gas use from free emissions to exploitation and transport, in initially small quantities to modern pipeline transport, is a defining element in the transformation of gas into a real economic asset. The need for long-distance transport through pipelines differentiates gas from other hydrocarbons traded during the twentieth century. Oil and coal could be stored on a long-term basis and transported by various means - ship, rail or road. Thus, the capital expenditure (CAPEX) for network construction, as well as the volatility of the gaseous products, have defined a first major risk of natural gas as an economic asset: the risk of security of supply and the security of demand (the existence of a market to consume the product being transported over long distances).

This binomial pair of risks of security of supply and security of demand, perceived halfway depending on the positioning of various actors as source or destination of a certain volume of gas (at one of the two ends of a pipeline), is what actually determined the entire contractual, financial and physical architecture of gas trading on international markets since the 1950s. Distributing the risks linked to construction of long-distance transmission networks is the second major shaper of gas transport mechanisms between markets. In fact, the way these two major risks

are shared between the producer and the consumer, 1. exploitation, transport and 2. guarantee of consumption, will always determine the level of liquidity for gas markets.

One of the first challenges in trading natural gas in a competitive market appeared because of the relatively new nature of gas as a commodity. With the discovery of the Groningen field in the Netherlands on 22 July 1959 by the consortium of Royal Dutch Shell and Exxon Mobil, the Dutch authorities faced the situation of having a humongous resource of more than 2.7 trillion cubic meters without being able to identify a dedicated market for these volumes. The fuel market was dominated at that time by oil and coal, which were already enjoying global stock-markets. Thus, the first obstacle for the large-scale marketing of gas was not a technical or risk-sharing one but positioning it in relation to existing products in the hydrocarbon market. The solution chosen by the Dutch government through the famous *Nota de Pous* was to define the price of this new resource as a substitute for oil for industrial consumers and town gas for household consumers. This decision had a major and permanent impact on the natural gas price formation process, linking it ever since to the crude oil price. This strategy, to define gas as a cheaper substitute for other hydrocarbons, has simultaneously triggered a long and unprofitable tradition in which gas production prices are decoupled from real costs, making real competition among producers impossible until relatively recently. This legacy continues today, by perpetuating natural gas price indexation according to oil price evolutions (also known as Oil Price Escalation - OPE) in European and Asian continental markets.

The two oil shocks of 1973 and 1979 led to the first impetus towards liberalization of energy markets. The OPAEC decision to introduce an embargo on oil exports to the United States in response to Israel's US arms support during the Iom Kippur war, coupled with the decline in US crude oil production, triggered a global oil supply crisis. In the aftermath of this crisis, as well as of the one of 1979, which was determined by the decline in world oil production following the Iranian Revolution, large consumers start taking decisions which will change gas markets for ever. Thus, the United States takes the decision to liberalize the price of natural gas through the 1978 Natural Gas Policy Act, aiming to create a competitive market for this vital asset. Simultaneously, Western European countries are beginning to look for solutions to diversify gas supply by building pipelines from the Soviet Union, but without considering the liberalization of energy markets as in the United States. Despite the United States' fierce opposition to Europe's growing dependence on Soviet gas, this pipeline build-up process will continue, thanks to a compromise that will limit Europe's dependency on Russian gas to 30% of the total gas demand at European level, in conjunction with the development of gas supply from Norway.

On the European continent, Britain is the first to follow the United States' example of market liberalization market through the government led by Margaret Thatcher. In the context of a general policy of liberalization, deregulation and privatization, between 1982 and 1996, the British government adopted successive legislative reforms culminating with the 1995 Gas Act. This was a decision that opened competition on the residential gas distribution market. These decisions transform British Gas's monopsony position (previously defined by legislation as the sole buyer of gas produced by private companies in the North Sea) into a free market where British Gas will be privatized and forced to transport its competitors' gas through its own pipes. The 1986 Gas Act also ends British Gas's monopoly on gas delivery to large consumers and establishes the first regulatory gas agency - OFGAS.

3. Regulating and creating the single internal energy market in the European Union in the first decades of the twenty-first century

The result of this overhauling reform of the gas supply, distribution and distribution system in the UK is in fact the fundament on which the reform, integration and liberalization of gas markets across the EU will be enacted through European legislation in the 1990s. The first liberalization measures have led to the inclusion of energy in the initiative to create a single European market in the late 1980s. There have been three successive legislative packages that have completely changed the regulation of gas markets in the European Union.

The first energy package, in 1992 for electricity, and in 1998 for gas, have terminated the existence of legal monopolies, allowing large consumers to freely choose their supplier. The legislators had already identified the risk stemming from the dominant position of vertically integrated enterprises. Thus, the first measures on third-party access to transmission networks (also known as TPA), as well as the launch of unbundling - have been included in these first directives.

The second legislative package of 2003 reinforced these decisions by adopting a timetable for full liberalization of electricity and gas markets by introducing non-discriminatory third-party access to the grid and by setting up national regulatory agencies. Assessing the impact of this legislation and remaining obstacles to the real competitiveness of the energy sector, the European Commission concludes in January 2007 that vertical foreclosure is a major barrier to new market entrants with a negative impact on security of supply. Thus, in order to allow end-users to benefit from the liberalization of gas markets and following the decisions of the European Council of 8-9 March 2007, the third legislative package, known as the "Third Energy Package" is put forward. This package, adopted by the European Parliament in 2009, puts at its core the liberalization of the gas and electricity markets by separating the distribution from production. The package also provides for:

strengthening consumer rights, clear definitions of regulatory agencies' tasks and defining the cooperation of national regulatory agencies with the Agency for the Cooperation of Energy Regulators - ACER (also newly created).

The Energy Infrastructure Package, adopted in 2013, complements the legislation in force at that time by adopting measures to support the development of cross-border network interconnections with a view to completing the single European energy market. This enhanced support is granted to projects of common interest (PCI), as defined by the methodology set out in this legislative package. The support is structured on four levels of action: setting up a mechanism for speeding up the development of infrastructure permits, setting up a cross-border cost allocation mechanism for construction costs, regulating the allocation of tariff and non-tariff incentives and financing through grants and financial instruments. From 2014 onwards, the funding arm directly dedicated to building the PCIs is the Connecting Europe Facility. This 30 billion-euro fund allows the allocation of grants and financial instruments to attract private investment for cross-border transmission network interconnection projects.

The legislative evolution of the European Union over the last 25 years towards a single energy market is continuing through the European Energy Union, a programmatic document that precedes the legislative acts of the 2014-2019 parliamentary term of the European Parliament. This strategy is built around the three major objectives of the EU energy policy: security of supply, sustainability and competitiveness. To achieve these goals, the strategy provides for five major action lines: *"(1) energy security, solidarity and trust; (2) completion of the internal energy market; (3) the contribution of energy efficiency to moderating energy demand; (4) decarbonisation of the economy; (5) research, innovation and competitiveness."* In addition, the strategy is not limited to enumerating strategic objectives and programmatic structures. The focus of the strategy are the 15 action points, i.e. the 15 legislative proposals scheduled for the next four years.

The European Energy Union thus provides a legislative framework and a unique structure for achieving these objectives. Intelligent use of this framework could bring Europe more quickly to the full development of regional energy markets, thus breaking the monopoly of bilateral secret contracts with fixed delivery and price clauses. This will allow for prioritization of investments for Projects of Common European Interest, and the use of new funding methods and will accelerate regional co-operation to synchronize projects and integration efforts. That is why we conclude this section by stating that the moment chosen to undertake this research perfectly fits with the efforts to modernize infrastructure and to unify the energy market of the European Union.

4. The globalisation of gas markets. The role of gas pipeline networks, gas hubs and LNG gas trade

The decision to liberalize the gas market in the United States of America in 1978 represents the act that initiates the internationalization of gas transactions. However, the creation of the premises of a global gas market would have been impossible without the technological advance of the two types of gas transport infrastructure: gas pipelines and gas liquefaction technology.

Gas pipelines, through which large gas volumes can be transported over long distances, have become economically viable only after the development of welding technologies after World War II. However, this type of gas transport, despite enabling the first international transactions, has also contributed to the deepening of the price paradigm where gas prices remain decoupled from supply and demand mechanisms.

Gas liquefaction technology has been a real technological revolution that has allowed gas to be stored on board tankers that move it via shipping routes anywhere in the world.

Since 1959, the transport of liquefied gas has allowed the creation of a new gas market, free from any risk associated with transmission pipelines. The intensive capital costs necessary for the construction of the transcontinental pipelines and the pipeline associated risks (transmission corridor security risk, supply risk and consumer demand stability risk) have become obsolete in a transmission system that knows no fixed routes, and where sellers, the buyers, and consumers are no longer forced to enter long-term binding relationships.

The final investment decision for constructing gas liquefaction terminals is taken by gas producers only if the production capacity is in surplus compared to the domestic market consumption. In LNG markets, buyer demand fluctuations remain indifferent to the sellers since liquefied gas can be sent by LNG ships to any destination market based on spot demand at the time of delivery. On the other hand, the construction of an LNG regasification terminal is decided by the buyer only when the market to which it is addressed, and the supply shortage are large enough to pay off the investment. This is how LNG gas infrastructure is developed while maintaining competitive pricing compared to natural gas transported via pipelines.

We can conclude that LNG has a completely different price formation structure, where security of demand is indifferent to the producer, and security of supply remains an important concern of the consumer, especially in cases where these deliveries are the only source of supply.

One of the important differences between pipeline gas and liquefied gas is that the LNG producers do not depend on a single buyer or a fixed number of buyers, as is the case with gas pipelines. Therefore, in the case of LNG, the sellers do not focus on strengthening, maintaining, deepening or even controlling relationships with existing buyers, but they will always look for new outlets to identify the best-selling prices.

In the case of pipelines, both sides are dependent on the fixed pipeline route, and therefore they will be determined to nurture and expand a symbiotic relationship. These physical peculiarities of the two types of gas markets also define the geopolitical aspects of international gas transport. Therefore, in the case of pipelines, there will always be a vendor's strategy to secure unhindered access to routes and destination markets through various diplomatic or economic methods so that there is no fluctuation in consumer demand for gas. However, despite this mutual dependence between seller and buyer in markets supplied by gas pipeline, a direct causal relationship cannot be established between the increased gas price and the dependence on gas pipelines. On the contrary, in the Asian markets, which are exclusively dependent on liquefied gas, the price of wholesale gas is significantly higher than in the markets where it represents only a part of the total gas supply. However, the causality relationship is real when comparing market liquidity and price level.

Parallel to the development of both gas transport technologies (pipelines and LNG), and legislative developments on both sides of the Atlantic, the globalization of gas markets was also driven by the development of free trading markets: virtual as well as physical ones. In these markets, prices have begun to be established solely by supply and demand mechanisms. These free trading markets were created around the major consumer and export centres. Physical and virtual trading platforms, also called trading hubs, allow market players to trade gas through direct price-based mechanisms based exclusively on demand and supply, without resorting to indexing gas prices to oil quotations, and without forcing the parties to enter long-term bilateral contractual relations.

Today, international natural gas transactions are experiencing a deepening globalization with a generalized convergence of wholesale global prices, driven by the gradual integration of European hubs and the continued development of new gas export sources in a cautious investment climate. Although there were major discrepancies of 10 percent, and above, between the different regions of gas before 2015, today the liquid market prices are almost equal.

There is only one exception: liquid markets dependent on a single supplier. In Europe, these markets are particularly present Eastern Europe, where gas transport

infrastructure is still limited to gas pipelines linking Russian Federation fields to Western European consumer markets. The limited size of these markets, insufficient interconnection capacity, as well as difficult access to the global LNG market are the factors that isolate these markets from the liberalization of the price formation mechanisms.

The competition between the various gas sources, hereafter referred to as Gas on Gas Competition (GOG), is the one which, following the reasoning above, allows the price of gas to be set at the most competitive level. In the absence of multiple international suppliers and different sources of supply, these still underdeveloped markets remain trapped in the Oil Price Escalation (OPE) mechanism - with the direct effects of higher prices compared to Western European markets.

5. Romania's potential contribution to liberalising Eastern European gas markets in the context of the new global gas architecture and the European gas market integration

The structural differences between the means of transport of natural gas relative to other hydrocarbons have led to a specific global price formation mechanism. Initially, gas price indexation to oil and its transport through captive infrastructure - gas pipelines - have created major barriers to liberalized wholesale gas trading. However, with the development of liquefied gas transport - LNG, its technological advances and especially through the creation of gas trading hubs, the phenomenon of internationalization and liberalization of natural gas price formation mechanisms has become a reality.

These major changes in the gas pricing mechanisms have important effects on the speed and size of the integration of European and global gas markets. At the same time, the widespread integration of gas markets triggered, at least in recent years, a phenomenon of price convergence in regions with real competition between different gas sources. However, regions without real competition between sources remain captive to oil pricing mechanisms, with fixed delivery clauses, which do not allow price evolutions at the same pace as liquid markets. It's rather stating the obvious that liquid gas markets are the ones that allow real competition and competitive prices.

Romania thus has the chance to benefit decisively from these changes in the global and European gas markets. The newly discovered reserves in the Black Sea can function as an enabler for a Romanian surplus trading platform. These findings, however, are only the initial premise of a possible ascension of Romania in the architecture of the European gas hubs. The discovery and subsequent exploitation of these substantial reserves does not guarantee itself the evolution of the gas

market towards a hub, which would allow Romania to benefit from all the advantages offered by the development of a competitive, liquid market, fully interconnected to the global gas market.

The possible benefits of a fully liberalised Romanian gas market with a functional trading hub are:

- Ensuring security of energy supply for Romania's economy and population for at least 30 years
- Ending the dependence on a single energy supplier for all gas volumes currently not covered by domestic production
- Substantial increase in the liquidity of the national gas market with the direct consequence of reducing suppliers' bargaining power to the benefit of buyers, i.e. transforming the market from an oligopolistic situation to a competitive market
- Decreasing wholesale prices by integrating the Romanian market with other European and global markets through increased increasing liquidity and diversified supply
- Starting the export of gas traded on the Romanian market to states in the region, turning Romania into a regional exporter of alternative gas to Russian supplies (for the Republic of Moldova, Bulgaria, Greece, Serbia, Hungary, Austria)
- Creating and locating in Romania a regional gas trading hub for South Eastern Europe.

In order to benefit from the above-mentioned advantages, Romania must also pursue and fulfil three objectives of equal importance:

- Establishing and implementing of a regulatory framework for market regulation and gas trading that would allow the development of a virtual trading point on which spot, futures and OTC (over the counter) gas volumes can be freely traded
- Construction of the infrastructure allowing the transit of gas from the Black Sea to the natural gas transport system, and to the gas pipelines transiting the territory of Romania to other markets
- Construction of interconnections with all neighbouring states in order to allow the physical export of gas (Republic of Moldova, Hungary, Bulgaria, Serbia, Ukraine).

At present, the major reserves discovered in the Black Sea, are just a prerequisite condition which can guarantee a substantial surplus to the annual size of the

domestic market, which measures about 11.7 billion cubic meters per year. Interconnections are though not yet fully functional, although they are partly built towards Hungary and Bulgaria. The biggest delays are those related to the development of gas market regulations that would attract more competitors and increase market liquidity, as well as interconnections with all markets and gas flows in the region.

In 2016 there were only two main producers of natural gas active in the Romanian market, accounting for 93.5% of domestic production together. Moreover, the two virtual gas trading platforms: OPCOM and the Romanian Commodities Exchange - BRM, represented only a tiny volume of transactions in relation to the size of the annual gas market of about 0.39 billion cubic meters, i.e. only 3% of the total.

However, the year 2017 brings a major change in the volume traded on the Romanian Commodities Exchange platform, with an increased level of over 6.5 billion cubic meters, according to ANRE National Report, while there was no transaction on OPCOM. However, these quantities are not detailed and may be a reporting of volumes offered for trading rather than traded. The confirmation of this promising volumes would constitute an important step towards reaching a level of traded volume that could facilitate the existence of a liquid gas hub in Romania. However, the volumes reported for our market are far from what can be seen in the established hubs in UK's National Balancing Point, with 2.275 billion cubic meters, and the Netherlands' Title Transfer Facility, with 2.051 billion cubic meters, even if they are weighted by the size of those national markets of gas. In contrast, compared to emerging but functional hubs such as PVB in Spain with 3 billion cubic meters or French PEG, with the 10 billion cubic meters reported in the OIES analysis, the evolution shows an alignment of the Romanian trading platform to the emerging European ones.

In what regards the diversity of the traded products or of the active players in the market, as well as of the "churn rate", we can speak of a true uncharted territory because of the total lack of reporting on these indicators, in the absence of which there can be no Romanian hub. We recall, however, that the level at which international traders decide to enter a trading platform is 10 times the multiple of existing commodities. In other words, the traded volume must be ten times higher than that of physical exchanges, which means trading the same volume of gas several times. The best performing hubs reach a level of 20 or 50 of that mark.

In addition to these statistical indicators of liquidity, we will mention also the delay due to the legislative instability of the adoption of a final investment decision regarding the newly discovered resources in the Black Sea. This delay makes it impossible to create a surplus gas in the market which would exceed domestic

consumption needs. Without the need and power to export natural gas, there can be no liquid natural gas hub, such as those in the UK or the Netherlands. Moreover the impossibility of accessing volumes other than indigenous or Russian gas strongly restricts liquidity in the Romanian market. Therefore, it is necessary to complete the infrastructure connection to the major European gas flows, if Romania is to function as a gas arbitrage hub which can balance prices offered for Russian Pipeline gas and new southern corridor gas which will start flowing through the SCP-TANAP-TAP pipeline complex.

It is obvious, therefore, the early stage of the Romanian trading platform, also certified by the ranking that the Romanian hub receives in EFET's latest annual report on the development of European hubs, with three points out of a maximum of 20. This score places the Romanian platform behind some countries in the region such as Hungary, Slovakia, Greece or Turkey, surpassing only Bulgaria rated with one point only. We conclude that the Romanian natural gas trading hub cannot really exist in the absence of liquidity aggregation from the entire Southeast European region.

Moreover regulatory framework which should foster real market liberalization, remains alas the level of intent. The Action Plan 2.1 of the High-Level Working Group on Energy Interconnection in Central and South Eastern Europe - CESEC, notes that Romania has not implemented the European Network Codes on Interoperability, Network Balancing and Congestion Management. More importantly, there is no assumed horizon for increasing the liquidity of the trading market or for adopting legislation to lift the restriction of gas exports to other states (established under the Government Emergency Ordinance 64/2016).

A very important signal in this respect, which confirms the slow pace of the gas regulatory reform, is the investigation launched by the Competition Directorate of the European Commission - DG COMP. This investigation, launched in June 2017, aims at verifying the existence of a dominant market abuse of Transgaz SA regarding restrictions on natural gas exports from Romania.

Evidence of such a strategy that could have been manifested by: manipulation of *"charges for the use of interconnection transport systems; insufficient investments or delays in building the appropriate infrastructure, as well as technical arguments unfounded as a pretext to prevent or justify delays in exports"* would totally contravene the stated plan to create a liquid gas market in Romania. Future market and regulatory developments will show whether Romania can truly contribute to European energy security, becoming a gas hub for the Eastern European region.

6. Conclusions

Thus, we can conclude that the relatively late entry of gas into the global fuel mix (after coal and oil) has led to the construction of a traditional price formation mechanism by reference to oil quotations. At the same time, due to its physical nature, which prevents the storage of large enough volumes, and which initially restricted the gas pipelines, gas becomes a fuel treated until the end of the 20th century as a geopolitical key. However, the geopolitics of gas, manifested *a la lettre* through the construction of gas pipelines between the USSR and Western Europe, following the oil crisis of 1973 and 1979, simultaneously triggered the first gas liberalization initiatives in the United States and the United Kingdom. These developments are then included and expanded into the main development of the Single Market of the European Union through the series of EU legislation on total liberalization and unification of gas markets, which continues today. From a technical point of view, the evolution of technologies that allow liquid gas to be transported on liquefied natural gas tankers, coupled with the discovery of huge US shale gas resources, both entirely enabled by technical innovation, accelerated the change of wholesale price formation mechanisms to natural gas. Thus, traditional oil price reporting as well as restrictive price clauses have dropped in the share of the global price-fixing mechanism.

In this article, we have demonstrated, by applying the comparative analysis method of the Western and Asian markets, that those markets where the share of pipeline gas is overwhelmingly large will be characterized by symbiotic relationships between buyer and seller with greater influence and involvement of the latter, compared to the LNG-dominated Asian countries where the buyer freely decides the source of supply. Transposing this situation into the differences between the liquid gas markets in Western and those in Eastern Europe, which are characterized by their low degree of liberalization and the lack of access to the global market, has allowed us to illustrate the advantages that Romania would have of developing the gas market liquidity and the contribution that Romania would have to ensuring energy security in the European Union, as well as becoming a major regional gas player.

This article outlines several clear advantages that place Romania ahead other locations with regard to the build-up of the regional South-eastern European gas hub, such as:

- higher reserves in relation to domestic consumption, as confirmed in the Black Sea.
- the positioning of Romania between the two major European natural gas transport corridors, which gives the Romanian hub the opportunity to function as an arbitrage mechanism between the markets and sources of supply in the region, including through the trading of Romanian gas.

- building and upgrading existing or new infrastructure, such as the BRUA project, which will cover a two-way gas transit area that would cover the entire South Eastern European region including Ukraine, the Republic of Moldova and the opening to Central Europe, and the South.

The region's liquidity aggregation, a *sine qua non* condition for the realization of the Romanian gas hub, which can be achieved by developing the infrastructure for connecting the new Black Sea resources to the neighbouring markets and by realizing all the interconnections through which the Romania would acquire the role of balancing region between the northern corridors transiting Russian gas, and the southern Corridor transiting Azerbaijani gas. Regional cooperation for the completion of Vertical Corridor projects linking LNG terminals and new gas reserves of Eastern Mediterranean to Romania, among which we note BRUA and the Interconnector Greece-Bulgaria, are therefore absolutely vital for the Romanian hub.

We conclude the series of take-away points of this article, stating that, unfortunately the latest developments on the Romanian political scene in 2019, the lack of a long-term predictable decision on the offshore tax regime and the free and transparent regulation of the gas trading market, export or exchange instruments, will most likely mean the end of the Romanian regional gas hub project, in the absence of new gas and new pipelines and in the absence of a liquid gas market.

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