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The case for the Ionian-Adriatic Pipeline

A Jón-Adriai csővezeték kérdése

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Abstract: The natural gas sector in most of the Western Balkans is largely underdeveloped. Consumption is low, as is infrastructure penetration. In recent years, new sources have become available, which, provided the necessary infrastructure is built, can change the situation and increase the use of gas in the region. This paper presents the Ionian-Adriatic Pipeline, which would link the Trans-Adriatic Pipeline with the Croatian gas transmitting system. In doing so, it could make access to gas a reality for Albania, Montenegro, and possibly Bosnia and Herzegovina and Kosovo, while increasing energy security in the region. The feasibility of this project, its benefits and possible implications are discussed, concluding that the construction of this pipeline would be a wise decision and significantly benefit the region.

Keywords: Ionian-Adriatic pipeline, natural gas, Western Balkans, energy security.

Összefoglalás: *A földgázszektor a Nyugat-Balkán döntő részén alulfejlett. A fogyasztás és az infrastrukturális lefedettség is alacsony. Az elmúlt években új források váltak elérhetővé, amelyek – abban az esetben, ha a szükséges infrastruktúra rendelkezésre áll – megváltoztathatják a helyzetet és megnövelhetik a gáz használatát a régióban. Jelen elemzés a Jón-Adriai csővezetéket mutatja be, ami összekötné a Transz-Adriai vezetéket a horvát gázszállító rendszerrel. Ezáltal a gázhoz való hozzáférés realitássá válna Albánia, Montenegró, és jó eséllyel Bosznia-Hercegovina és Koszovó számára, miközben nőne a térség energiabiztonsága. A projekt megvalósíthatóságát, előnyeit és lehetséges hatásait tárgyalom, arra a következtetésre jutva, hogy a vezeték megépítése bölcs döntés lehetne és jelentős előnyökkel járna a térség szempontjából.*

Kulcsszavak: *Jón-Adriai csővezeték, földgáz, Nyugat-Balkán, energiabiztonság.*

Introduction

Natural gas in general

Natural gas is a fossil fuel source that releases about half as much carbon-dioxide when burning compared to coal or oil. Other advantages include that it burns without releasing smoke, and it is easier to transport and distribute than oil, and especially coal. Thus, natural gas is often used residentially for heating and cooking purposes. Perhaps just as importantly, in many countries – Italy being a textbook example – gas plays a crucial role in electrical energy generation. In the generation sector, the reduction in emissions compared to other fossils, as well as the relatively easier process of starting up the plant,

make natural gas a competitive option for baseload, which can be tailored in grids with ever-increasing renewable capacities. Furthermore, natural gas is used in many industries not only as a source of energy but also as raw material for the chemical industry. The spatial distribution of this resource varies widely, which in turn requires transportation. This is mostly done in two ways: using pipelines or using ships, which mainly carry natural gas in a liquefied state (LNG).

The gas and energy sector in the Western Balkans

The gas sector in the Western Balkans, in comparison to most EU countries, is significantly underdeveloped. While the cause of this underdevelopment is not in the scope of this paper, the historical general underdevelopment of the region from an economic, industrial, and infrastructural aspect is among the reasons, as is the lack of large quantities of gas resources. This lag behind can be seen in both low gas infrastructure penetration and low gas consumption, data for which were collected and processed for this article.

Table 1.
Annual consumption of natural gas in 2018 for the Western Balkan countries, Croatia, Hungary, Italy, and the EU-27. Source of raw data: International Energy Agency, unless indicated otherwise.

Country	**Annual gas consumption**			**% of total energy**
unit	GWh	billion m^3 (bcm)	kWh/capita	
Albania	372	0.036	133	1.37%
Bosnia and Herzegovina	2,314	0.221	697	2.67%
Croatia	25,500	2.4	6,280	26.9%
Kosovo	395	0.038	220	1.45%
Montenegro	267	0.026	430	2.23%
North Macedonia	2,420	0.231	1,163	8.10%
Serbia	24,800	2.4	3,560	13.9%
Hungary	96,200	9.92	9,840	30.1%
Italy	692,000	66.2	11,440	39.5%
EU-27	3,780,000	361	8,470	22.0%

Of the countries listed in Table 1, Albania, Kosovo, and Montenegro have no gas transmission systems, i.e. a network of pipelines. With no such access, this form of energy cannot possibly be popular either with residents or with the industrial sector. The default option gas consumers have when transmission systems are missing is having the gas delivered in canisters, which is not as safe or nearly as convenient as piped gas would be. Bosnia and Herzegovina (BiH) and North Macedonia have systems that cover a small part of the country. For BiH, this coverage includes the area of Sarajevo and some other neighbouring towns; gas is brought in via a pipeline from Serbia. As for North Macedonia, the cities of Skopje, Kumanovo, and Strumica have gas distribution systems, with gas fed in from Bulgaria. According to the annual report of the country's energy regulatory body, many other towns are to follow shortly, due to investments being made in the transmission system. Serbia, and particularly Croatia, have systems that cover most of their territory. In Serbia, the existing grid is comprised of a main axis spanning from Sombor to Niš, supplying Belgrade, Novi Sad, and other important towns. While previous imports were made through Hungary, starting in 2021, imports are made from Turkish Stream, via Bulgaria. In Serbia, there are 260,000 households connected to the gas grid, accounting for roughly 10% of total consumption. Croatia, more gas-intensive than any of the WB6 countries, has a transmission system that covers most cities and towns across the country. The system is fed via Slovenia and Hungary, and the southernmost reach of the pipelines is the city of Split. The total number of households connected to the gas grid exceeds 620,000, accounting for almost 20% of total gas consumption.

Croatia is also the only country that uses gas for electricity generation. On average, approximately 25% of electricity generation, or around 15% of consumption comes from gas power plants. The rest of the domestic production is covered by hydro resources and imports. The high dependence on imports will only grow after the aging Krško nuclear power plant, owned in half by Croatia, is shut down in the foreseeable future. Provided prices are favourable, this offers a good opportunity for gas power plants to be built. Albania is also a net importer of electricity, with the entire domestic production based on hydro sources. Electricity generation in both BiH and Montenegro is split between coal and hydro sources, with coal more important for the latter, which is also a net electricity exporter. Kosovo, on the other hand, relies solely on coal for generation, with new capacities needed to meet growing demands and to replace outdated, polluting units. In Serbia, roughly two-thirds of the generation comes from coal, with the rest coming from hydro sources. North Macedonia is also dependent on coal, although it has some gas-fired power plants and is committed to switching the coal-run units to gas.

Having a more detailed picture of the gas sector, we can now come to the seemingly trivial – although very important – observation that the gas sector will only grow if the necessary gas transmitting infrastructure exists. Apart from

the number of households with gas access and the generation of electricity by gas (or lack thereof), per capita gas consumption, as calculated for this article, perhaps best expresses the differences between the countries (see Table 1 above). If we look at the figures, we can see that consumption in Albania, Kosovo, and Montenegro, where there is no access to piped gas, is roughly five times less than in BiH or North Macedonia, where gas coverage is only partial. At the same time, consumption in these two countries is roughly five times less than in Croatia or Serbia, where access to gas is much more widespread. This accounts for a roughly 25 times larger value compared to Albania, Kosovo, or Montenegro.

Accepting that *the lack of infrastructure is the main reason behind the underdevelopment of the gas sector in the Western Balkans,* we can argue that we need new infrastructure built in order to foster development. A proposed pipeline, the Ionian-Adriatic Pipeline (IAP), passes through the region. This article presents this project, along with a country-specific analysis and potential future developments, and it investigates whether the IAP would be a feasible project.

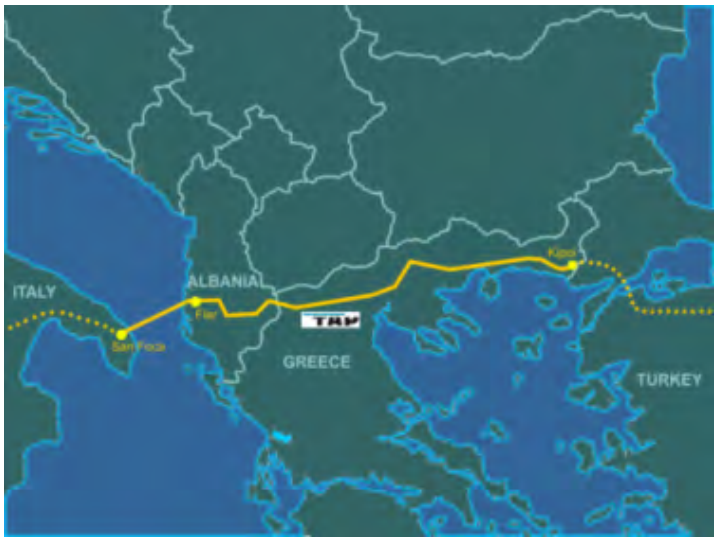
The Ionian-Adriatic Pipeline

Intermezzo: Trans-Adriatic Pipeline (TAP)

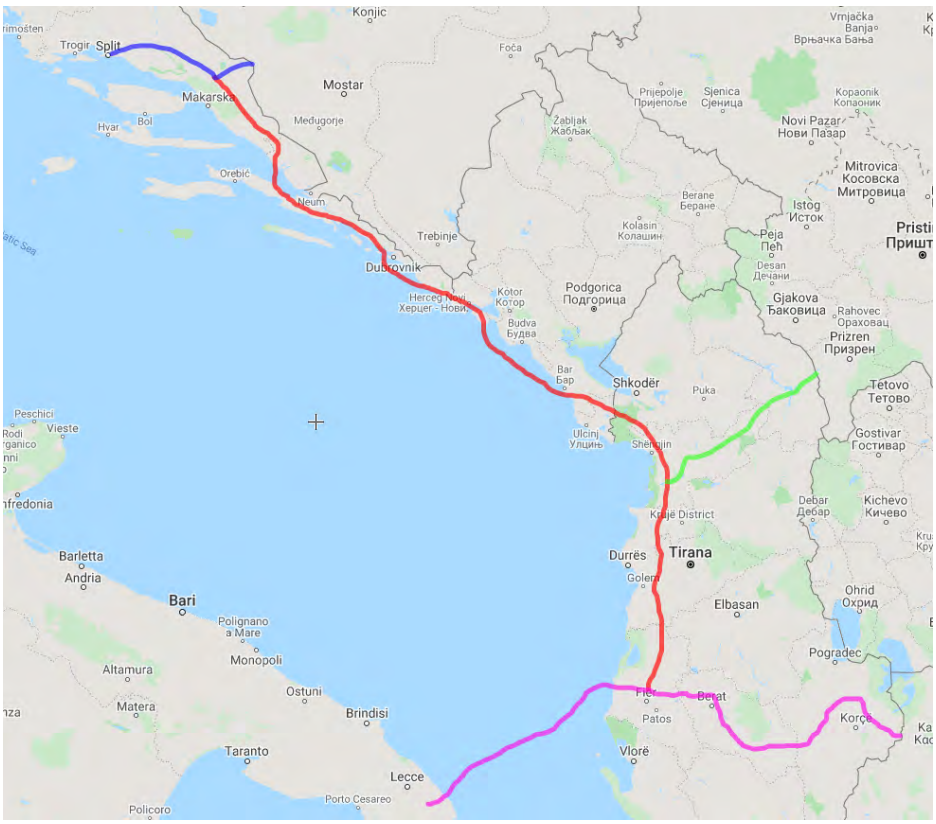
TAP is a pipeline that starts at the Turkish-Greek border, crosses through northern Greece, enters Albania, and then crosses the Adriatic Sea to be connected to the Italian system. The pipeline was constructed due to a need to transit gas from Azerbaijan to the European markets. This is done through the existing Trans-Anatolian Natural Gas Pipeline (TANAP). Construction started in 2016, with commercial utilization having started in 2021. The transmitting capacity of the pipeline is 10 billion cubic meters (bcm) per annum, with another parallel pipe planned, which would double the capacity. For comparison, annual consumption is around 3 bcm in Croatia, 10 in Hungary, and 70 in Italy. This project is what has prompted interest in investment in the Western Balkans gas infrastructure.

The proposed Ionian-Adriatic Pipeline (IAP) would connect TAP with the Croatian gas transmission network at its southernmost point, in Split. The trajectory starts at a bisection of TAP close to Fier, Albania, then it continues north, entering Montenegro by the coast and eventually having a considerable part offshore, to later re-enter the shore. From there the line enters Croatia and remains inland, passing through the Pelješac peninsula (in front of Neum), thus avoiding passing through BiH. Then, going offshore for a short length, it enters mainland Croatia, where it continues until Split, joining the main Croatian gas transmission network.

Map 1.
TAP path. Source: tap-ag.com



Map 2.
TAP and IAP projects. The projected path of the IAP is given in red. The Albanian section of TAP is given in violet, and of the proposed interconnection with Kosovo in green. The Croatian part of the interconnection with BiH is given in blue.



The main concept is a pipeline that can provide stable and large-quantity imports into Croatia. The capacity of this pipeline would be 5 bcm annually, which is almost double the Croatian gas use for 2018. However, one must not forget that transmission networks are rarely – if possible, never – used to their nominal capacities; in order for a system to be stable, interconnection supplies must be significantly larger than the average consumption. Furthermore, this pipeline would not only supply Croatia but most of Albania, Montenegro, and potentially BiH and Kosovo, too. These countries would take gas by means of other, smaller pipelines fed by the IAP. For the case of Kosovo, such a branch would start about 40 km away from the Montenegrin border and continue northeast, to enter close to the town of Prizren. The branch would have a capacity of approximately 1 bcm per annum. For BiH, according to the Croatian plans, the investment is separate from IAP. What this means is that in practice, the connection with BiH will be done whether or not IAP gets constructed, and IAP would end at this trifurcation, which is approximately halfway between Split and the point where the pipeline enters mainland Croatia. An annual capacity of approximately 2-3 bcm is expected for the BiH interconnection.

The local gas markets after IAP construction

The situation described in the introduction makes it clear that the gas market can blossom once the infrastructure is there. Let us now consider the countries one by one and examine how the project would benefit them.

In the case of Albania, the construction of IAP would facilitate the gasification of the capital, Tirana, and the city of Durrës, which together make up for around one million residents, as well as most of the country's modest industry. According to the country's gas master plan, an increase in energy consumption from gas from 506 GWh in 2018 to 15,950 GWh in 2040 is to be expected. This, of course, foresees the construction of the main artery, from Fier north, which provides gas to most consumers. Apart from the residential and commercial sectors, this gas consumption for 2040 – which corresponds to over 1.6 bcm annually – partly goes to electricity production. This would be particularly advantageous for Albania, since the entire current electricity production is completely weather-dependent.

Regarding BiH, let us remember that the project avoids passing through it completely. According to the Croatian plans, the pipeline connecting IAP and BiH would have an annual capacity of approximately 2 bcm, feeding the western, mostly Croat-inhabited part of the country, close to Mostar. North of Mostar, it would be connected to the current system, which passes entirely through Republika Srpska, ensuring the parts this system supplies continue to have

access to gas despite an aging infrastructure. This interconnection, however, is not the only connection the Croatian operator plans to build. Regarding electricity generation, it is probably not as likely that BiH will switch its coal-fired power plants to gas in order to reduce emissions, since this would incur a very high cost.

Croatia would increase its energy stability, having supplies from Slovenia, Hungary, the recently built Krk LNG terminal, and IAP. The addition of this source might presumably lead to slightly lower prices and allow the export of gas from TAP north, to or via Hungary and Slovenia. Remembering that the IAP project is meant to be bidirectional, Croatia can also use this pipeline to supply the other countries. In addition, with increased trading opportunities and a liberalized market, the gas producer in Croatia – which currently covers about half the country's needs and can continue to do so for at least a decade – might sell to foreign markets. Apart from this, the construction of the pipeline provides an opportunity for the gasification of the southern Dalmatian coast.

The construction of IAP would bring gas much closer to Kosovo, and with the interconnection it could provide quantities of up to 1 bcm annually. In Kosovo, the residential sector would benefit, along with district heating systems, which now run on coal. Regarding electricity generation, the country still needs to solve the issues of deficit and polluting coal plants. The most recent, so-called Kosova e Re project to construct a new coal power plant was disbanded, and it should be noted that even though the coal is domestic, the projected buying price for the electricity was not low. In any case, it is difficult to imagine that a gas power plant could possibly produce at a lower price than local coal. In other words, gas is unlikely to become a means of electricity generation in Kosovo in the near future.

For Montenegro, this pipeline would be the only means of getting gas into the country. According to estimates, annual consumption will reach over 0.5 bcm, where the use will be residential and commercial. On the other hand, North Macedonia and Serbia are unlikely to be influenced by the project, since they are largely supplied by other sources, namely interconnections through Bulgaria.

The case for IAP

Let us now recapitulate what the construction of this pipeline would mean in economic terms and also discuss the topic from a geopolitical point of view.

IAP would make gas supplies much more secure for all the countries it passes through. Furthermore, since it provides a new alternative, it stabilizes the Croatian market and the immediate neighbouring markets of Hungary and Slovenia, providing another route for gas imports from other, non-Russian sources. Not only can IAP be used as a source to power the markets north, but, if need

arises, the flow can be switched to power southern markets from northern routes. In both cases, this would increase the importance of all the countries the pipeline crosses through. Apart from this, these countries will also benefit from transit fees, which, although not a major income, would be considerable.

To Albania and Montenegro, this pipeline is practically the only way to start the gasification of the countries, which would be a new reality to the citizens of these countries. A considerable boost can be expected in energy consumption as well as a large economic boost with this construction, especially considering the small scale of the local economies. Furthermore, with the introduction of gas, a great step towards a more stable and environment-friendly energy sector will be made, keeping in mind that many locals use wood residentially, while power utilities use coal for electricity generation.

Another feature through which the project adds to energy security is the possibility to utilize and connect underground storage capacities to the gas network. These underground storages (for example the ~ 3 bmc one in Dumre, Albania, and other existing and potential ones in Croatia) are empty spaces in geological formations that can be filled with gas in order to provide gas at peak demand, while being filled at seasons of low demand. Such large capacities are particularly significant for the region.

Potential difficulties

First and foremost, the cost of this project is far from negligible to the countries it includes. These costs are expected to be around 150 million euros for Albania and Montenegro each, and about 300 million euros for Croatia. Due to inexistent transmitting systems in Albania and Montenegro, a common company will most probably have to be set up for the entire project, which would later also run the pipeline. Even though the repayment period is short – assumed to be ten years, according to Montenegrin estimates – the source of financing also needs to be taken into account. Furthermore, political willingness is also a factor to be considered. The respective ministers have signed a memorandum of understanding in 2016, and there seems to be no reason for them to object to this investment.

At this point, it is important to distinguish that this cost, in the order of around 600 million euros, does not mean that gas will be up and running in homes in Tirana, Podgorica, Mostar, or Dubrovnik. This is only the cost of the transmission system, the IA pipeline. To the disappointment of most locals, upon construction the local distribution systems will also have to be built, which might take years and investments a few times higher than those of the IAP project. Though at first sight this might seem irrelevant, public support might fall if this reality is taken into consideration.

Keeping in mind that the demand from the countries on the way will take a significant time to grow, it is logical to assume the pipeline would create redundant input capacities into Croatia, especially considering the recently operational Krk terminal. This means that Croatia would temporarily be a transit country only, adding pressure to the existent interconnections with Slovenia and Hungary.

Other projects being implemented near the region, such as the Turkish/Balkan stream, may seem to be rivals to this project, providing competition or rendering them obsolete. It should be understood, however, that IAP is a project of mostly regional relevance and not a means of massive supply transiting, like Nord Stream or Turkish Stream. In this regard, IAP stabilizes the south-eastern European market, especially in an area that has had no reach to gas. The Krk LNG terminal can also be viewed as such an opponent, as do the Montenegrin plans for their own terminals. If a terminal is indeed built before the pipeline, the latter would no longer have a monopolistic position. However, the existence of the IAP pipeline would mean that the gas imported through these terminals can be distributed to other markets as well.

Current State and Conclusion

As of 2021, the construction of IAP is part of the strategies of all the countries it passes through. A memorandum of understanding between the governments has been signed, and most preliminary technical plans have already been made. A common company that would undertake the implementation of the project has not been created yet, although companies and organizations responsible for the sector from all countries have cooperated on the project.

As far as feasibility is concerned, it can be said that this project would likely be a good investment. Apart from the financial benefits, the energy security and environmental profits of the project further increase its importance.

Whether and when the project will become reality still needs to be seen. The Croatian gas transmitter plans to start work on their part of the project no earlier than the second part of the decade. As for the other countries, to the best of our knowledge, there are no timelines for the project.

The demand for gas in the region will continue to grow with time. IAP can quickly provide countries with gas in quantities even an order of magnitude larger than the current consumption, thereby greatly accelerating this growth.

Independent of the growth in consumption in the countries it passes, IAP would ensure more reliable supply, diversify gas import alternatives, and allow gas from TAP to be transmitted to markets to the north of the Balkans.