



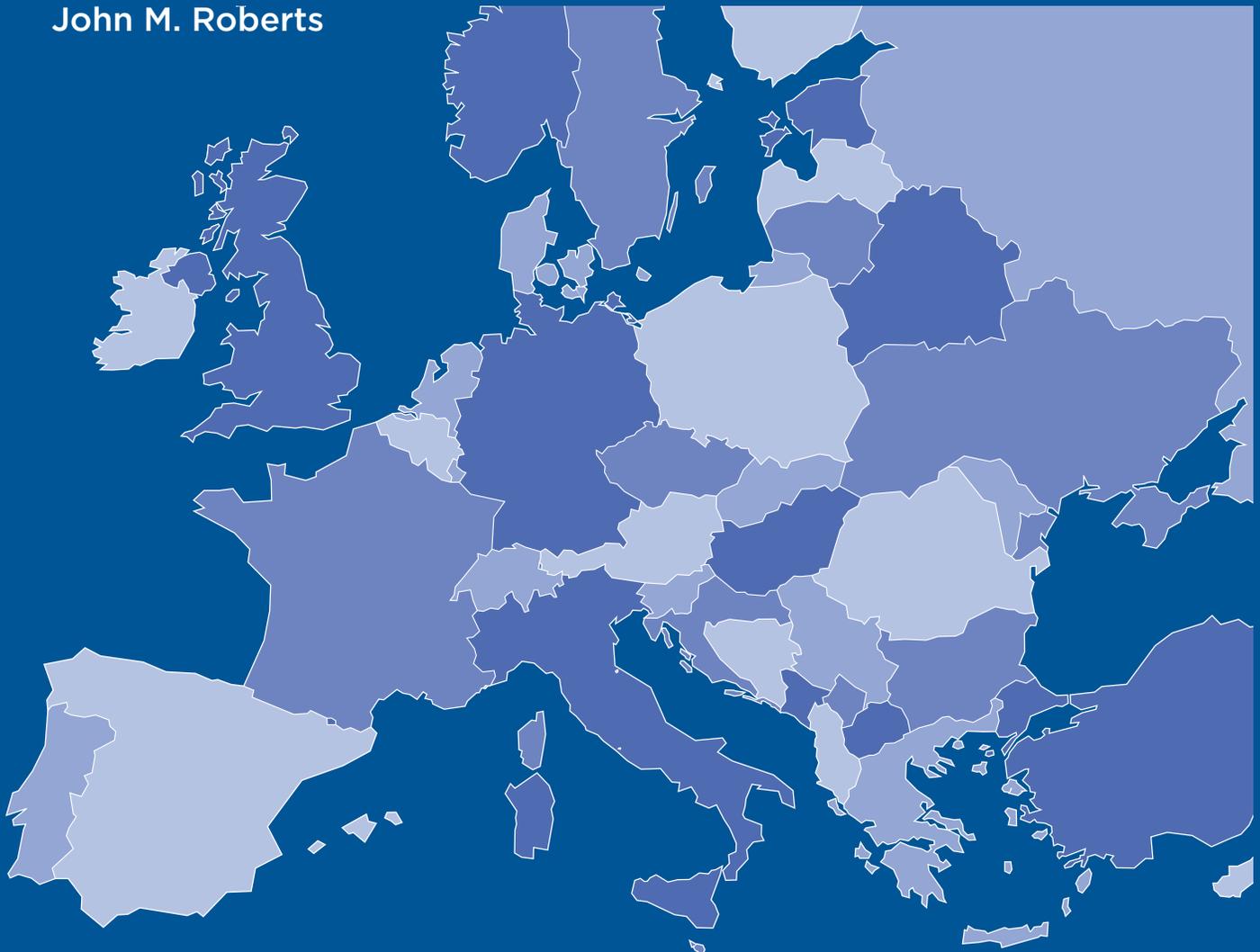
**Atlantic Council**

GLOBAL ENERGY CENTER

# Three Pipelines and Three Seas: BRUA, TAP, the IAP and Gasification in Southeast Europe

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John M. Roberts





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## INTRODUCTION

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European plans for greater integration of gas networks in the continent's former Warsaw Pact regions are critical. They are also in flux, due to Russia's moves to develop its own alternative systems and the lack of cooperation by some governments—notably Hungary's—whose countries benefit from closer integration. Threats by Russia and a lack of progress on interconnectivity threaten to weaken the goal of the free flow of gas between the Baltic, Adriatic, and Black Seas, as outlined by the Three Seas Initiative (3SI) promoted by twelve European member states at the Three Seas summits in Dubrovnik in August 2016 and in Warsaw in July 2017.

The issues principally concern the future of four projects: three pipelines and one liquefied-natural-gas (LNG) regasification terminal. The first is the Trans Adriatic Pipeline (TAP), which could end up in the paradoxical position of being built as an alternative to Russian supplies while eventually serving as a conduit for Russian gas delivered through Gazprom's new TurkStream project. The second is the BRUA (Bulgaria, Romania, Hungary, Austria) pipeline, which faces severe problems because of Hungary's signaled opposition to transit arrangements to Austria, a move with potential consequences for the development of Romania's offshore gas. The third is the Ionian Adriatic Pipeline (IAP), which would promote gasification in the western Balkans, both by linking TAP to the Croatian network via Albania and Montenegro, and through the development of spurs to Bosnia and Herzegovina, Kosovo, and Macedonia. The fourth is the still-unresolved issue of when—or whether—a final investment decision will be made regarding the long-planned Krk LNG terminal in Croatia.

In the background are numerous consequential issues, including the impact that BRUA, IAP, and Krk LNG could have on the Three Seas Initiative by developing effective energy interconnections between countries bordering the Baltic, Adriatic, and Black Seas.

These are the core infrastructure elements for the future of gas integration in Southeastern and Eastern Europe. But, although both BRUA and TAP are well advanced, with contracts awarded for the former and three-quarters of the pipelaying accomplished for the latter, progress cannot be taken for granted. TAP's landfall in Italy continues to pose problems; BRUA faces problems concerning Hungarian noncooperation; IAP still needs to break out of its planning cocoon; and, although it seems imminent, there is still no final investment decision for development of the Krk Island LNG terminal.

Details of the current state of each of these four main projects—BRUA, TAP, IAP, and Krk Island—can be found in the accompanying box (*Box 1: The Major Projects Covered in this Report*), along with similar details concerning two Russian-sponsored projects—TurkStream and Nord Stream 2—whose development is profoundly shaping the environment in which BRUA, IAP, Krk Island and, especially, TAP will have to operate.

This paper is not focused on Nord Stream 2. However, this project, a 55-billion-cubic-meters-per-year (bcm/y) system from the Gulf of Bothnia to Greifswald, Germany, constitutes the northern element of Russia's strategy to bypass Ukraine and, potentially, Poland as well. This strategy will likely have a major impact on TAP, as the strategy's southern element, TurkStream, may end up as the source of gas for second-stage input into TAP, even though the political rationale for TAP was to bring gas from non-Russian suppliers to Europe.

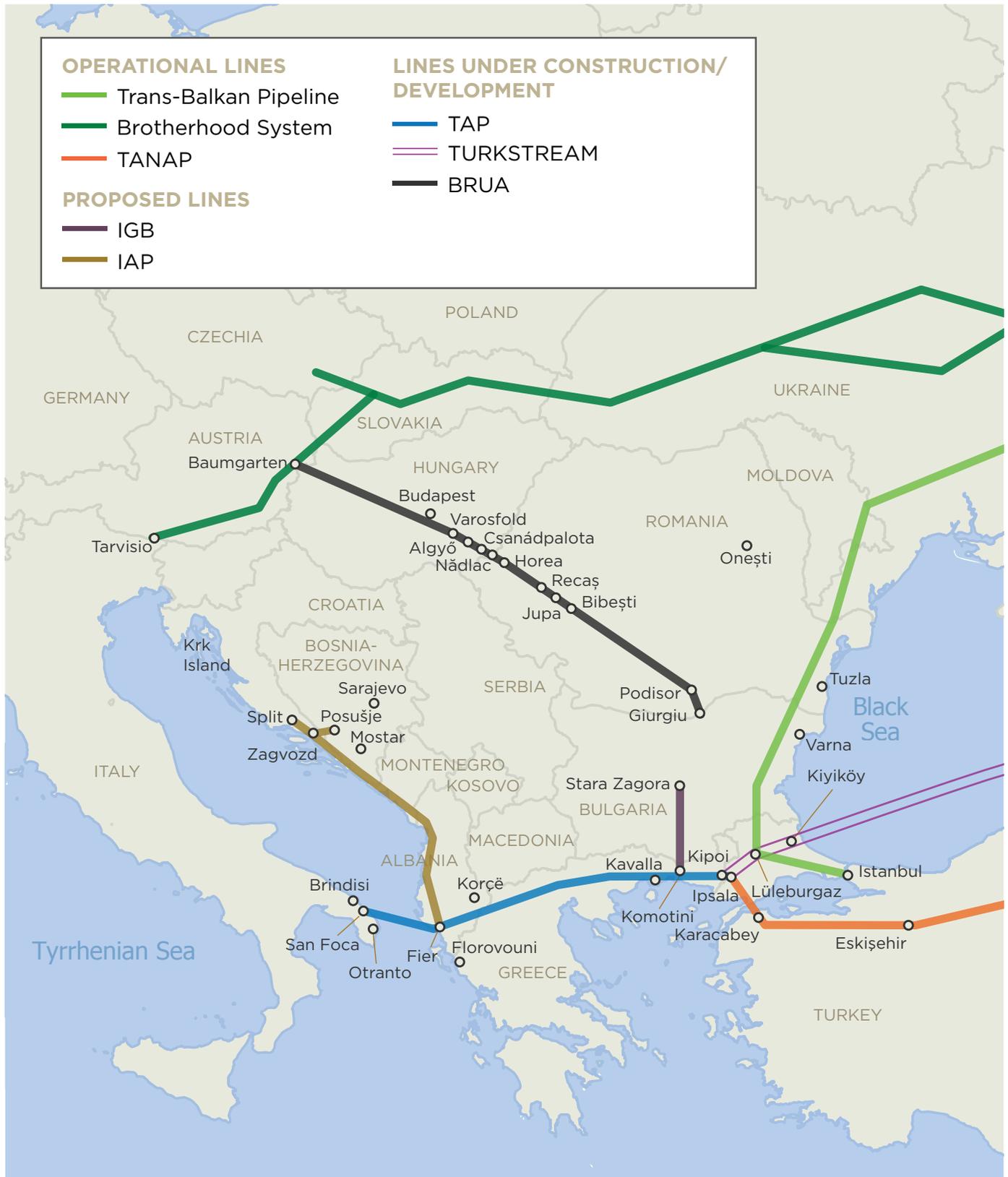
The intense political debate that accompanies gas development goes to the heart of two key issues confronting European energy security and the development of gas-import infrastructure—pipelines and LNG regasification facilities—as well as gas-pipeline interconnectors for internal distribution. First, how much should the promoters of European energy security rely on commercial approaches to ensure the development of key infrastructure, and how much should they seek to enable projects to become commercially viable in the operational phase by helping to fund initial construction? Second, how can European institutions promote energy security on a broad regional basis—if not on a Europe-wide one—in the face of governments' increasing promotion of their national interests? This is particularly challenging for the Central and South-Eastern Europe Energy Connectivity (CESEC) High-Level Group.

Ensuring broad connectivity between the gas systems in the Baltic, Adriatic, and Black Seas will depend on how far institutions such as the European Union and the Energy Community are able to resolve these two issues.

### **The Promotion of Energy Security on a Europe-wide Basis**

The Balkans are the largest region in Europe where markets remain largely dependent on a single gas supplier: Russia. Commercially, this means Balkan customers have no way to challenge their monopolistic supplier,

Existing, Planned, or Proposed Long-distance Pipelines in Southeast Europe



Source: Atlantic Council.

Gazprom, on price. Politically, this makes Balkan governments wary of antagonizing Russia.

The Three Seas Initiative envisages physical pipeline connections that would benefit the Balkans, providing access to new gas sources through connections to new pipelines carrying gas from non-Russian sources or accessing LNG imported at regasification terminals. In the latter case, there is a focus on Greece and the Aegean Sea, because the establishment of LNG terminals on the Black Sea coast would cause problems in view of Turkey's consideration that LNG constitutes a hazardous cargo and its view that, in an ideal world, LNG tankers should not use the Bosphorus Strait. This confines any putative Black Sea LNG trade to crossing from one side of the sea to another. The proposed Azerbaijan-Georgia-Romania-Interconnector (AGRI) includes LNG shipment from Georgia to Romania, but this is theoretical, as it lacks gas to supply it, and—even if supplies were available—it would prove uncommercial at current prices.

Within the Balkans, Greece and Croatia could benefit from the development (or further development, in Greece's case) of LNG regasification facilities, as well as from the major new pipeline system currently in advanced development, the Southern Gas Corridor. However, the landlocked states of the Balkans—such as Serbia, Macedonia, and Kosovo—require regional cross-border infrastructure to challenge Gazprom's monopoly. In contrast, the landlocked nations of Central Europe—Hungary, Slovakia, the Czech Republic, and Austria—already have access to gas from a variety of sources. These countries can base their choice on whether to buy gas from Russia or other suppliers on price. Even if they opt to buy 100 percent of their gas from Russia, it is still being purchased at rates directly comparable to prices in nearby gas markets (see *Box 2: Views on Gasification in Southeast Europe*).

While Balkan countries can benefit from Poland and Lithuania's experience developing LNG regasification plants, the lack of medium-scale north-south infrastructure in Central Europe means that the Baltic terminals have little or no impact on Balkan gas markets. On the positive side, the development of gas-pipeline links within Poland, and the prospective further development of an integrated Baltic gas network, means it is not only countries with LNG regasification terminals on the Baltic that benefit from their presence. Lithuania's Klaipeda LNG terminal and Poland's at Świnoujście were developed to serve national purposes, but their consequences extend

internationally as cross-border interconnectors are developed. The same applies with even greater force to pipeline imports that enter the EU from Norway and North Africa, as well as Russia, since internal European pipelines enable them to serve much of Central and Western Europe, as well as their immediate neighbors.

On the negative side, the lack of a major north-south interconnector confines the Baltic terminals to exemplars for gas-supply diversification, if not guarantors. This is still important, as Lithuania was notably able to recover much, if not all, of the \$200 million cost of developing Klaipeda LNG from reductions in the price of Russian gas imports—enabled simply by the announcement that Lithuania would construct an alternative.

The lack of a significant north-south corridor illustrates the limits of integrated planning concerning European energy security. The question of Balkan gas development has to be seen in terms of linking the states bounded by the three southern seas—the Black, the Adriatic, and the Aegean—rather than as a means to ensure their connection with the Baltic.

Yet, such a separation is not absolute. Ukraine's connections with its neighbors hold out the possibility—particularly if Russia achieves its goal of ending Ukrainian transit—of a radical re-think of the way Europe distributes its gas supplies. In a Three Seas context, Ukraine could yet play a pivotal role in gas (see *forthcoming Atlantic Council paper by David Koranyi*).

### The Commercial and Political Underpinnings of Gas Infrastructure in Southeast Europe

Pipeline development routinely includes tension between commercial operators and customers who want the capacity of gas-transport systems to match expected commercial volumes, and political forces concerned about the need for an insurance policy in case of a supply interruption. This is about insurance policies, how big an insurance policy might be required, and who should pay for it.

The costs of increasing a pipeline's size to bolster energy security and commercial interests are not that great. Europe's Agency for the Cooperation of Energy Regulators (ACER) concluded that whereas pipelines with diameters of 28 to 35 inches could cost around 1 million euros (€) per kilometer, pipelines with diameters of 36 to 47 inches cost around €1.4 million per kilometer.<sup>1</sup>

<sup>1</sup> Agency for the Cooperation of Energy Regulators, Report on Unit Investment Cost Indicators and Corresponding Reference Values for Electricity and Gas Infrastructure (Ljubljana, Slovenia: ACER, 2015), table 8, p. 20, [https://www.acer.europa.eu/official\\_documents/acts\\_of\\_the\\_agency/publication/uic%20report%20-%20gas%20infrastructure.pdf](https://www.acer.europa.eu/official_documents/acts_of_the_agency/publication/uic%20report%20-%20gas%20infrastructure.pdf).

## BOX 1: The Major Projects Covered in this Report

### BRUA

In theory, BRUA is a 1,318-kilometer system intended to connect Bulgaria, Romania, Hungary (Ungaria in Romanian), and Austria. It takes its name from the Romanian initials for these four countries. In practice, it is way of creating a modest 4.4-bcm/y system through a mixture of incorporation or upgrading of existing gas lines, and the addition of extra compression and, in places, new line. Major elements of the first two phases of this three-phase project are already under way.

Phase One is focused on developing 1.75 bcm/y of reverse-flow capability between Romania and Hungary. It includes a new 479-kilometer pipeline from Podișor to Recaș, together with a metering station and three upgraded compressor stations at Podișor, Bibești, and Jupa. Financial backing includes a 2014 grant from the EU for €179.3 million of the anticipated €560 million required for the Romanian sections, while the European Bank for Reconstruction and Development (EBRD) is currently on the verge of approving a further €60-million loan for this section of BRUA, which will help cover the cost of compressor stations. On November 28, 2017, Romania's Transgaz awarded three contracts for construction of the core 479-kilometer sections within Romania from Podișor to Recaș. Phase One is expected to be completed in 2019.

Phase Two essentially comprises the construction of a 32-inch, 50-kilometer pipeline between Recaș and Horia to connect to Hungary, together with upgrades to four compressor stations at Podișor, Bibești, Jupa, and Horia to ensure 4.4 bcm/y in firm bidirectional capacity between Romania and Hungary. It also includes construction of a 6.0-bcm/y-capacity line from the newly discovered Black Sea gas fields to a connection with the main BRUA system at Podișor. According to current Romanian plans, this should be operational in 2020—and possibly earlier. Phase Two, which also includes the addition of further compression at either Csanádpalota or Algyó in Hungary, is intended for completion in 2022. By August 2018, Transgaz stated in its half-yearly report that it would be investing €360 million in the development of the 308-km line between Tuzla and Podișor to carry Black Sea gas to Hungary and Bulgaria via BRUA.<sup>1</sup>

Phase Three involves the expansion of an east-west system across Romania, between Isaccea, roughly 80 km from the Black Sea coast, and Nădlac, on the border with Hungary, via Onești, located some 250 km north of Bucharest.

Overall, current work on BRUA is intended to fulfil two purposes: to serve as a limited set of interconnectors in

the four countries through which BRUA passes, and to enable production from Romania's offshore gas fields to reach both the domestic Romanian market and, in a limited fashion, export markets. In this context, the goal is to enable Romanian gas to secure access to the TAP pipeline in the south, and to the Austrian hub at Baumgarten in the west. However, there are currently problems concerning westward connections across Hungary to Austria. Since late 2016, Romania's gas system has been connected to Bulgaria by means of a 1.75-bcm/y interconnector; this would have to be upgraded to ensure a consistent capacity of at least 4.4 bcm/y throughout the planned BRUA system.

### TAP

The Trans Adriatic Pipeline (TAP) is an 878-km pipeline, and a key element in the \$40-billion set of projects known as the Southern Gas Corridor (SGC). Construction of the line, which starts at the Turkish-Greek border at Ipsala/Kipoi and is intended to end at a terminal near San Foca in southern Italy, is close to completion in both Greece and Albania. Officially, the project is expected to start delivering gas from Azerbaijan's giant Shah Deniz gas field to Italy in early 2020. However, this timetable is threatened by ongoing disputes concerning the vital final sections of the pipeline, namely the 105-km subsea connection from Albania to Italy, the 8-km connection from the subsea line to the receiving terminal at San Foca, and the related 56-km line from the receiving terminal to a connection with Italy's gas grid.<sup>2</sup>

The overall SGC system is primarily focused on bringing some 6 bcm/y of gas from Azerbaijan to Turkey, and a further 8 bcm/y to customers in and beyond Italy. Its TAP element is also intended to deliver modest volumes of gas to Bulgaria, Greece, and Albania. With additional compression, TAP is capable of doubling its overall capacity, enabling it to serve as a broader connection between suppliers in the Caspian and the Middle East and consumers throughout much of Europe. Although TAP is primarily conceived as a vehicle for transporting gas from east to west, a reverse-flow capability is being built into the system so that, if necessary, it could carry gas from west to east, thus enabling North African gas landed in Italy to reach markets as far afield as Turkey and Bulgaria.

### The Krk Island LNG Regasification Terminal

The Croatia LNG project is intended to provide regasification facilities so that liquefied natural gas (LNG) arriving by sea can be imported into Croatia for use by Croatian or

1 Sorin Melenciuc, "Transgaz to Invest EUR 360 Mln in Key Pipeline for Romania's Offshore Gas Projects," *Business Review*, August 21, 2018, <http://business-review.eu/energy/transgaz-to-invest-eur-360-mln-in-key-pipeline-for-romanias-offshore-gas-projects-181596>.

2 See Roberts, *Europe's Southern Gas Corridor: The Italian (Dis)connect* for a full discussion of this issue.

other regional customers. LNG Croatia LLC, the company developing the project, envisages buying and anchoring a floating storage and regasification unit (FSRU) just offshore from Omišalj, on the island of Krk. Initial capacity would be 2.6 bcm/y with scope for expansion as onward pipeline connections are developed. Former LNG Croatia CEO Goran Frančić said in early 2018 that a final investment decision would be taken in the third quarter of 2018 if an Open Season, under way in mid-2018, demonstrated there was sufficient demand to justify the project. If there is an FID this year, then the aim is to complete the project by the end of 2020. The EU has pledged €124 million for the project, which should cover close to half the cost of securing the FRSU unit. Croatia LNG effectively replaces a previous concept, first developed in 1995, for an onshore-based regasification facility known as the Adria LNG project.

### The Ionian Adriatic Pipeline

The Ionian Adriatic Pipeline (IAP) is envisaged as a 32-inch diameter line that would enable the gasification of Albania and Montenegro, southern Croatia and Bosnia and Herzegovina by connecting these markets to TAP and the SGC. It is a project that has considerable political support but, as yet, there have been no firm decisions concerning its development and there is little indication as to who will provide the funds or when a final investment decision (FID) might be expected. A feasibility study by Denmark's COWI was completed in 2014 and calculated the project's cost at €618 million. The study envisages a 540-km system, the core element of which would be a 511-km, 32-inch line from a junction with TAP at Fier in Albania to Split, where it would connect with Croatia's existing gas network. Such a line would have a capacity of around 6.5 bcm/y. It would also be fully bidirectional, so that it could also deliver gas from Croatia, including gas received via the planned Krk LNG terminal, south to Albania. There would also be a 22-km connection from an offtake point at Zagvozd in Croatia to Posušje in Bosnia-Herzegovina.

### TurkStream

This project, sometimes known as Turkish Stream, is intended to bring Russian gas to Turkey and to European countries beyond Turkey by means of twin 15.75 bcm/y pipelines, technically called "strings," but which Gazprom officials have dubbed TurkStream 1 and TurkStream 2. Russian Prime Minister Dmitry Medvedev has said the first

string (TurkStream 1) "will be completely oriented toward the Turkish market" and that "the second is aimed at supplying European countries."<sup>3</sup> Pipelaying operations for the 920-km subsea section of the first line were completed in April 2018 with onshore works also underway for the connection to Turkey's existing gas network north of Istanbul. In June 2018, the pipelaying vessel *Pioneering Spirit* was laying TS2 pipe in Turkey's exclusive economic zone (EEZ), a task it should complete this year. Gazprom is working to have the first string, TS1, operational in 2019, but it is not yet clear when TS2 will become operational.<sup>4</sup> For the Balkans, the key issue is what happens to gas conveyed by TS2 after it reaches Turkey. Russia has costed the overall project at around €6 billion (\$7 billion), but the final cost will not be known until there is certainty on how TS2 will reach markets within the European Union.<sup>5</sup>

### Nord Stream 2

Nord Stream 2 is a planned 55-bcm/y pipeline from the Russian coast near St. Petersburg to Germany. It is envisaged as a companion to the 1,224-km, 55-bcm/y Nord Stream 1, which opened in 2011. Implementation of the project is already under way, with the first physical pipe delivered to the Finnish port of Koverhar in July 2017. However, some key outstanding issues, notably concerning compliance with EU regulations, raise questions concerning the start of actual operations, or even whether the line will be completed at all. Current problems with Denmark also mean that the final routing will almost certainly be slightly different from Nord Stream 1, so the precise length of the line has yet to be determined. Throughout much of 2017, the goal was to have the line operational in 2019, but a group report in November 2017 appeared to indicate that the current aspiration is to have the line functioning in 2020. Even this timetable, however, is likely to be subject to delay as a result of strong political objections from some EU member states, notably Poland, and US-imposed sanctions on personnel associated with the project.

The cost of the project is estimated at €9.5 billion, with capital expenditures put at €8 billion, and with some €4.5 billion already committed by November 2017. The project is being developed by the Swiss-registered Nord Stream 2 AG, which is 100-percent owned by Russia's Gazprom. Five international companies—ENGIE S.A., OMV AG, Royal Dutch Shell plc, Uniper SE, and Wintershall Holding GmbH—have each agreed to provide up to €950 million in financing.

3 "Talks under way on extending Turkish Stream to EU—Medvedev," Interfax Natural Gas Daily Europe, May 23, 2017, <http://interfaxenergy.com/gasdaily/article/26025/talks-under-way-on-extending-turkish-stream-to-eu-medvedev>.

4 Somewhat confusingly, technical experts say that the *Pioneering Spirit* has actually been laying twin 32-inch pipes for each string. These would each have a regular capacity of just under 8 bcm/y.

5 In 2015, Gazprom announced that it expected TurkStream to cost €11.4 billion (about \$12.5 billion). But this was clearly for a four-string system, as it put the cost of the first string—always the most expensive—at €4.3 billion. The reduction on a cost-per-string basis to \$3.5 billion, since current costs for a two-string system are estimated at \$7 billion, may well reflect the decline of the rouble against the dollar.

## BOX 2: Views on Gasification in Southeast Europe

There is a widespread desire for gasification throughout the Balkans, as exemplified by various comments heard during the preparation of this report. The following comments come from nationals intimately involved in national and regional gas development.

From Bosnia and Herzegovina: “We are aware that Bosnia-Herzegovina, as a member of the Energy Community, has difficulties in achieving the obligations arising from the membership and that it is necessary to make additional efforts, but all Bosnia-Herzegovina gas efforts have no sense if there is no basis for market development and security of fuel supply. In the case of natural gas, it would be the need for security of supply and the need for a new project to help us develop new gas markets in Bosnia-Herzegovina.”

From Montenegro: “The most important project concerning gasification of Montenegro is IAP.”

From Macedonia: “We are looking to gas to power. We want to integrate our internal gas market with regional gas. We will get cheaper gas price and cheaper electricity and heat provision,” and, in future, “we can get gas from the Southern Gas Corridor and Revithoussa [Greece’s LNG terminal].”

From Croatia: “Gas is important for the Balkans because it is only energy product that can, in relatively short term, replace coal, a major fuel for electricity production. Development of renewables is still expensive and needs to be subsidized so it is not relevant for this purpose. In the near term, renewables can have only minor impact on coal substitution.”

From Romania: “Natural gas is the most straightforward way to dislodge coal from the energy mix of the Southeast

European [SEE] countries which are so heavily dependent on it. Otherwise, there is no way these states can achieve the EU’s decarbonization targets. Gas-fueled power generation is an adequate counterpart to renewables growth, as the latter requires ample balancing and back-up services on the electricity market. Natural gas has the clear prospect of becoming a more abundant, diversified fuel, even in a part of Europe still under Russian monopoly, given the expanding interconnections and the ongoing development of the Southern Gas Corridor. In addition, prospective development of the recent gas finds in Romania’s Black Sea sector offers SEE the prospect of a new source, in regional competition on the Gazprom dominated market. This gives Romania in particular a reason for deeper gasification of its economy.”

From Albania: “Gasification of the power sector alone could reduce CO<sub>2</sub> [carbon-dioxide] emissions in the Balkans region by between 20 percent and 55 percent by 2040. The old fleet of thermal power plants and other industries using diesel and coal in Serbia, Macedonia, and Montenegro are still producing enormous quantities of CO<sub>2</sub>. Albania, Montenegro, and Kosovo, all of them NATO countries and EU membership candidates, would be connected to the Western European gas grid through a connection with the Southern Corridor, ensuring they were no longer dependent on Russian gas.”

In contrast, there is perhaps a somewhat lukewarm attitude in Serbia. One official, talking about prospective gas-for-power generation, commented: “Relatively low electricity prices make it relatively hard to introduce this process. There are certain projects for gas plants, but all of these projects depend on the gas price.”

Such estimates, however, refer only to the immediate costs of purchasing materials and laying the pipe.

The difference in laying a 32-inch line, which might be routinely expected to carry up to 6.5 bcm/y—as per the IAP’s current specifications—and a 36-inch

line capable of carrying some 10–15 bcm/y is minimal in terms of cost, but substantial in terms of volume carried. This would not be the case, however, for a much larger system—such as a 56-inch, 30-bcm/y system—since it would require much more land and equipment.<sup>2</sup>

<sup>2</sup> Assessing the capacity of a pipeline is like determining the length of a piece of string. Variable factors, all of which impact the final cost of a line, include the amount of compression, the thickness of the pipe, the quality of steel used, and the interval between compressor stations. For example, the twin 18-kilometer subsea connections for TANAP under the Turkish Straits each consist of a 36-inch pipeline designed to carry 10 billion cubic meters. Yet the 235-kilometer, 36-inch subsea interconnector between the Grasweg compressor station in the Netherlands and Bacton in the UK had an initial capacity of 16 bcm/y and, with the addition of a fourth compressor at Grasweg in 2010, gained the ability to push as much as 19.2 bcm/y to the UK. One reinforced section of the 42-inch South Caucasus Pipeline, through the southern Caucasus mountains in Georgia, which will be used to carry gas from both phases of Azerbaijan’s Shah Deniz field to customers in and beyond Turkey, originally entered service in 2007 with an eight bcm/y capacity. But, it is slated to carry close to 25 bcm/y from around 2022. A further cautionary element is that costs for laying pipelines in the European Union or in its associated countries are very different from those for pipelines developed in, or by, Russia. A very loose approximation of total pipeline costs for large-scale pipelines is between \$2.5–\$3 million per kilometer in Europe, but can run \$9–12 million per kilometer in Russia, even though Russian pipeline developers do not have to pay land fees, which account for a considerable portion of European costs. Part of the answer lies in Russia’s particularly difficult terrain, but a major part almost certainly stems from Russian energy companies’ desire to profit from actual construction of projects, in contrast to the European (and US) focus on generating income from the delivery of oil and gas through the relevant infrastructure.

## PART I: THE SIGNIFICANCE OF BRUA

The development of the BRUA project poses near- and long-term issues, not least concerning its potential to bring to market a new source of gas from within the EU, either by delivery to a Central European hub like Baumgarten, Austria, or by connection into TAP. In the short term, the key issue is whether Hungary will deliver on its commitments to the project. In July 2017, Hungary's gas transmission-system operator (TSO), FGSZ, announced that the existing connection between Hungary and Austria was not economically efficient, and that Hungary should become the northern terminus for BRUA. Instead of heading to Baumgarten, FGSZ argued that gas coming north through BRUA could be forwarded from Hungary to Slovakia, Ukraine, Croatia, or Serbia. Hungarian officials have specifically said that connection from Hungary to Slovakia should serve for onward transmission of Romanian gas to Central Europe.

The question of BRUA's completion has become a sore subject between Hungary and Romania. At one stage, it appeared Budapest had backed down. Following talks in Bucharest on September 28, 2017, then-Energy Minister Toma Petcu of Romania declared: "It was agreed in a memorandum signed today that there will be reverse flow interconnections in all four states, including Hungary and Austria."<sup>3</sup>

In practice, however, the Hungarians have declined to proceed on the key issue, the expansion of the congested Hungaria-Austria-Gasleitung (HAG) system to allow more gas to flow freely between the two countries.<sup>4</sup> FGSZ had some justification for its approach, as the HAG system is periodically congested. However, if congestion was the reason for the FGSZ statement, then—at least from a European perspective—the logical development should be support for expansion of the HAG line to accommodate Romanian flows to Baumgarten.

In February 2018, Hungarian Prime Minister Viktor Orbán sought to sweeten the pot, saying Hungary was ready to buy 4.4 bcm/y of Black Sea gas from Romania—in

effect, the total potential throughput of BRUA. By cutting out the option for Romanian gas to transit Hungary to Baumgarten, Hungary would set itself up as a monopoly buyer for prospective Black Sea gas exports. "The Russian gas monopoly will end because we will get over half our gas from other sources, in this case, Romania," Orbán said in February 2018.<sup>5</sup> "This is a new situation, not only for Hungary but for the entire region. It means that Hungary will find itself in a new geopolitical position—one that is much more lucrative than in the past."<sup>6</sup>

The dispute became acute in June 2018, when FGSZ CEO Kristof Terhes, addressing skeptical Romanian questioners at a press conference in Bucharest, said that by dropping the need to develop new pipeline capacity to Austria, Hungary was actually saving Romania \$1 billion.

"What does it mean we have changed our minds, that we have put a plug between Romania and Hungary in a pipeline, and do not let the gas go through and lose income?" he said.<sup>7</sup> "We changed the benefits for you because your producer would use less money in Romania, because it does not have to spend another billion dollars on a new pipeline, since there is infrastructure already in. We have made you a great favor, I have given you a billion US dollars," Terhes said.<sup>8</sup> Judging by previous Hungarian statements, the previous connections he referred to were those between Hungary and Slovakia.

At one stage, Terhes argued that Romania could not use all Black Sea gas output itself, and that there was no way for it to export the gas to the north or south—therefore, it would need to be exported via Hungary. "It's simply too much for the domestic necessity of the country. You do not have a petrochemical industry; you cannot use natural gas as raw material. What will you do with the gas? Burn it? Make a big fire?" he asked.<sup>9</sup>

Two days later, while visiting Sofia for a high-level meeting of the CESEC group—and to attend the signing

3 "Gas Pipeline Through Central Europe to Go Ahead as Planned—Romania," *Reuters*, September 28, 2017, <https://www.reuters.com/article/romania-pipeline-eu/update-1-gas-pipeline-through-central-europe-to-go-ahead-as-planned-romania-idUSL8N1M93LS>.

4 The line is currently used to bring gas from Austria to Hungary. Theoretically, reverse flow through the existing system could be used to carry Romanian gas to Austria, but this is impractical so long as Hungary requires routine gas imports in the other direction.

5 Keno Verseck, "Romania and Hungary Clash Over Black Sea Gas Distribution," *DW Akademie*, July 18, 2018, <https://www.dw.com/en/romania-and-hungary-clash-over-black-sea-gas-distribution/a-44734925>.

6 Ibid.

7 Aurel Dragan, "The European Commission Supports BRUA Pipeline in Spite of Hungary's FGSZ Statements," *Business Review*, June 29, 2018, <http://business-review.eu/energy/the-european-commission-supports-brua-pipeline-in-spite-of-hungarys-fgsz-statements-174988>.

8 Ibid.

9 Ibid.

ceremony marking the official start of investment and works for the Interconnector Greece-Bulgaria (IGB)—EU Energy Commissioner Miguel Arias Cañete emphasized Europe’s continuing support for the original BRUA concept. Commenting on the IGB event—in effect, a declaration by the prime ministers of Greece and Bulgaria that construction would start at the end of 2018, and the line should become fully operational during 2020—Cañete noted that the EU was providing €179 million for BRUA, and problems with Hungary should be resolved smartly to ensure gas-supply cooperation. Central and Eastern Europe, he said, were the regions most affected by gas-supply disruptions, with consumers having to pay more for their gas than consumers in Western Europe, even though Russia, the main supplier, was closer to them than to its western customers.

Speaking underneath a map showing the full BRUA system extending from Bulgaria to Austria, the commissioner added: “Romania is doing a great job. Strengthening the infrastructure in Romania is a prerequisite for the BRUA corridor and we have seen what effort is needed to build such an infrastructure, but the benefits are enormous, in order to diversify supply routes and increase security and, at the same time, increase competition, with obvious positive effects. For these reasons, the Commission has supported this project from the start.”<sup>10</sup>

One worrisome possibility is that FGSZ, which enjoys good relations with Gazprom, is seeking to align itself with its Russian supplier to prevent Romanian gas from reaching Baumgarten and impinging on Gazprom dominance at the hub. On the other hand, the wishes of OMV—one of the developers of Romanian offshore discoveries, an Austrian company that might wish to deliver gas supplies to its home country, the principal shareholder in the Central European Gas Hub at Baumgarten, and a company that enjoys good relations with Gazprom—should be taken into account.

Hungary’s move threatens the basic concept of energy-market integration, since it effectively blocks Romanian gas from reaching Baumgarten. “We’re not amused at all by the fact that BRUA pipeline stops now in Hungary. There is a discussion about attracting Slovakia into the project, but this is not a convenient solution for us, because it means larger costs for our clients,” OMV board member Manfred Leitner said in London on March 12, 2018.<sup>11</sup>

### Hungary and Eastring

Hungary’s attitude toward BRUA demonstrates Budapest’s determination to keep its supply and redistribution options open. The development of BRUA is the most important element in a concept called the Vertical Gas Corridor (VGC), an umbrella for a collection of projects that would ensure a link between gas supplies reaching Europe through the Aegean (Greece) and arriving in the Baltic (Poland). In practice, however, the VGC can be seen as a southern connection to BRUA, by means of the long-planned Interconnector Greece-Bulgaria (IGB).

Hungary, however, also wants to see the development of the Eastring project, a rival concept to VGC. Just one month after signing the Bucharest memorandum of understanding (MoU) with Slovakia in support of Eastring. While both the VGC and Eastring want to develop gas connections between Southern and Central Europe, the two projects are very different. VGC is focused on developing a modest 4–5-bcm/y system, and is thus attainable in the current relatively low-price gas environment, in which there is limited cash for infrastructure investment. While Eastring envisages a massive 40-bcm/y system, its proposers do not indicate how it might be financed. While the VGC would essentially serve to carry supplies from known non-Russian suppliers—notably, Azerbaijani gas delivered via the Southern Gas Corridor (SGC) system or LNG arriving at terminals in Greece—the size of the volumes the line would seek to carry make it clear that Russia is the only conceivable source of gas for input into Eastring.

Gazprom’s cash limitations, given the cost of building major pipelines like TurkStream, Nord Stream 2, and the \$38-billion Power of Siberia gas line to China, make it unlikely that Russia would come up with the cash for Eastring. Promoting Eastring is quite another matter. The more it is publicized, the more doubt can be thrown on projects like BRUA, or the idea of at least some Gazprom gas transiting Ukraine once current transit contracts end in 2019.

Additionally, Hungary’s overall relationship with the EU cannot be taken for granted. Its willingness to implement any EU-favored program may be impacted by the ongoing disputes between the Hungarian government and the European Commission over core issues,

<sup>10</sup> Ibid.

<sup>11</sup> Sorin Melenciuc, “OMV ‘Not Amused’ to See BRUA Pipeline Stopping in Hungary, Says Some Black Sea Gas Could be Sold in Eastern Europe,” *Business Review*, March 13, 2018, <http://business-review.eu/news/omv-not-amused-to-see-brua-pipeline-stopping-in-hungary-says-some-black-sea-gas-could-be-sold-in-eastern-europe-161414>.



Turkish President Tayyip Erdogan poses with his counterparts Aleksandar Vucic of Serbia, Ilham Aliyev of Azerbaijan, Petro Poroshenko of Ukraine and Turkish Cypriot leader Mustafa Akinci during the inauguration ceremony of Trans-Anatolian Natural Gas Pipeline (TANAP), in Eskisehir, Turkey June 12, 2018. Credit: REUTERS/Umit Bektas.

including: the state of democracy in Hungary; rule of law; human rights, particularly concerning migrants; and the government's effort to close the highly regarded Central European University, funded by liberal Hungarian-born financier George Soros.

If Hungary really falls out with the European Commission, or even falls out of the EU, all bets concerning the completion of BRUA are off. In that case, the focus will most definitely shift to an emerging Hungary-Russia relationship, and its impact on European energy supplies and related infrastructure projects.

### BRUA and Romanian Offshore Gas

BRUA is crucial if Romania is to switch from being a net gas importer to a substantial exporter. While Romania has long been a significant gas producer, production remains pretty static, with a fall from 9.8 bcm/y in 2015 to 9.2 bcm/y in 2016, followed by a recovery to 10.3

bcm in 2017—but even 10.3 bcm/y is below average production levels from ten years earlier.<sup>12</sup> The discovery of substantial reserves off the coast should change this, so long as infrastructure is developed to carry the gas to domestic and international markets and the government's taxation and regulatory regime encourages both exploration and production.

In 2012, the partnership of Austria's OMV and the US ExxonMobil found gas in the Neptun block and has since invested between €1.5-2 billion in field development.<sup>13</sup> The reserve base is significant, with OMV, whose Petrom subsidiary is the field operator, estimating it at between 1.5 and 3.0 trillion cubic feet (Tcf), or between 42 and 84 bcm.

Other gas discoveries have been made by the Black Sea Oil and Gas Company (BSOG). Total reserves at BSOG's Midia complex, which includes proven reserves at the Ana, Doina, and Eugenia fields, are estimated at 10-20

<sup>12</sup> See Romanian production figures in BP, "BP Statistical Review of World Energy," June 2018, <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf>.

<sup>13</sup> Andrew Byrne, "Pipeline Setback Squeezes Romania Gas Export Ambitions," *Financial Times*, September 18, 2017, <https://www.ft.com/content/bc38b79e-6331-11e7-8814-0ac7eb84e5f1>.

bcm, and BSOG could start production by the end of 2019.<sup>14</sup> BSOG gained a significant boost when the European Bank for Reconstruction and Development (EBRD) announced in November 2017 that it would take a minority stake in the company, whose largest shareholder is the US-based Carlyle Group. Midia's development is estimated to cost around \$500 million, including gas treatment, a 121-kilometer offshore pipeline, and 30 kilometers (km) of onshore line to serve the treatment plant and connect with the national gas-transmission system.

Neptun's start up is not expected until around late 2020. OMV says Neptun should produce around 6.5 bcm/y, enough to cover Romania's imports and enable around 4 bcm/y for exports or petrochemical development. Neptun is just one of six blocks Romanian geologists believe might hold commercial gas reserves. If Midia comes on stream first, it should be able to cover Romania's current import requirements, ensuring Neptun output is available for export. Various other supply permutations are also possible, but the bottom line is that Romania's offshore resources constitute the only indigenous source of new European supply, at a time when overall European production is in sharp decline. In terms of energy security, Romanian supply can ensure supply diversification in the Balkans—particularly in markets that currently depend totally or overwhelmingly on Russia—and, if connected to a hub such as Baumgarten or a major transborder system such as TAP, can contribute to Europe's overall energy security.

Some key problems have already been overcome. A glitch in the law that prevented any pipeline crossing the shoreline has been resolved, and a much-delayed interconnector with Bulgaria opened. Technically, with existing loans to BRUA and key BRUA contracts in place, there is no immediate reason for offshore development to be deferred. However, Hungary's controversial attitude regarding BRUA's plans to connect to the Austrian hub at Baumgarten will mean that European institutions must maintain pressure to ensure Hungarian authorities live up to their obligations to develop the BRUA system and enable at least modest Romanian exports to reach Baumgarten. If not, it will become necessary to enlarge the connection to Bulgaria from its currently limited 1.5-bcm/y capacity and ensure a link to the TAP line. One way of doing this is for Romania to utilize the Trans-Balkan Pipeline that currently carries Russian gas to Turkey, Bulgaria, and

Greece, as Gazprom ceases its exports to those countries via that system at the end of 2019.

One further—and equally crucial—issue remains in dispute: the structure of taxation. The Romanian parliament is currently in the process of trying to pass a long-awaited law designed to pave the way for final investment decisions (FIDs) to be made by the companies seeking to develop the country's offshore hydrocarbon resources.

In July 2018, one house of Romania's bicameral parliament unexpectedly tacked a set of additional taxation measures onto its version of the legislation, triggering a major dispute between two of the country's most important political figures.

The measure passed by the Chamber of Deputies, the lower house of parliament, on July 9 made significant changes to the version of the law passed previously by the upper house, the Senate, concerning both taxation levels and the way gas was to be traded. The lower house is headed by its president, Liviu Dragnea, the leader of the country's ruling Social Democrat Party (PSD), although he is barred from formally holding the office of prime minister due to a previous suspended sentence for vote rigging.

On August 2, Romanian President Klaus Iohannis, whose role as head of state is essentially supervisory, sent the disputed law back to parliament for reexamination. He made various requests, including that the long-term stability and predictability of the legal framework applicable to this sector be taken into consideration to avoid potential negative effects—and that the law should secure the support of both houses of parliament.

The changes approved by the lower house were significant. In terms of taxation, they would set parameters for the revenues of the companies seeking to develop the country's offshore oil and gas resources. Should the companies exceed these parameters, it would levy taxes of between 30 and 50 percent on profits from the additional revenues. This version of the law also requires offshore title holders to trade at least half of their annual output “through contracts on centralized, transparent, public and non-discriminatory markets in accordance with the regulations issued by ANRE.”<sup>15</sup>

As the Chamber of Deputies passed its version of the law, Dragnea said the legislation meant “the Romanian

14 Newsbase, “Steady Progress in the Black Sea,” *EurOil: Europe Oil & Gas Monitor* issue 421, October 12, 2017, <https://newsbase.com/sites/files/euroil.pdf>.

15 ANRE is Romania's energy regulator, the Autoritatea Națională de Reglementare în domeniul Energiei. See “MPs Sent the Gas Companies Back to the Drawing Board. Will They Be Back?” *EnergyEconomics.ro*, July 10, 2018, <http://www.energynomics.ro/en/mps-sent-the-gas-companies-back-to-the-drawing-board-will-they-be-back/>.

state would thus receive 13.2 billion dollars” by applying this tax, in addition to estimated royalty income of \$230 million a year. There was no immediate indication as to how these figures were calculated.

The changes were attacked by the three main offshore investors. BSOG CEO Mark Beacom said: “There have been many successive governments that we have been working with, we’ve been given assurances, and those [assurances] are now being broken. Two years ago, our company was very close to being able to take the final investment decision [FID]. We just needed to get some of these issues resolved. I can say very clearly that what we have on the table today puts us in a much worse situation to the possibility of taking an FID than we were two years ago.”<sup>16</sup>

Richard Tusker, who heads ExxonMobil’s Romanian operations, and Christina Verchere, CEO of OMV Petrom, made the same point. “Following the change in the tax regime, it will become more difficult for each investor to take an investment decision,” Tusker said.<sup>17</sup> “After what have seen happened today, it will be harder to adopt the final investment decision to favor Romania,” Verchere commented.<sup>18</sup>

When President Iohannis sent the disputed law back to parliament for reexamination, he specifically called for three issues to be addressed:

- the necessity for clear, unambiguous regulation that ensures sustainable energy development and a practical partnership between energy sector investors and the state
- ensuring there is no damage to budgetary income
- adoption of the law by both the upper and lower houses of parliament

At the time of writing, this reexamination was expected to take place in September. However, finalization of the energy law could well be sidetracked as the PSD government tackles public protests against its efforts to weaken anti-corruption legislation.<sup>19</sup>

President Iohannis is a staunch supporter of the Three Seas Initiative. In October 2017, during a visit to Romania by Croatian President Kolinda Grabar-Kitarovic, the founder of the 3SI, the Romanian president bemoaned the lack of practical transportation links to connect the countries grouped in the 3SI, saying he wanted to make the 2018 Bucharest Summit “more visible, more efficient and ultimately to promote joint projects of substance.”<sup>20</sup>

He added: “There are also energy links existing or under construction on the East-West route, less so on the North-South route, and for Croatia and Romania, a connection between the Croatian ports and the Romanian ports on both on the Danube and the Black Sea would be highly welcome.”<sup>21</sup>

In this context, it is also worth noting statements made by Aaron Wess Mitchell, assistant secretary for the US State Department’s Bureau of European and Eurasian Affairs, in a June 18, 2018, speech at Bucharest University: “We applaud Romania for hosting the Three Seas Summit this fall and encourage all Three Seas members to identify and finance the concrete projects that will make this initiative a platform for change. Three Seas is not formulated as a competitor to the EU. Its point—and what I think should be a goal for all of us—is to find ways of systematically stimulating greater Western financial, infrastructural and commercial involvement in Central and Eastern Europe. We invite greater EU participation in this and other regional projects and we encourage our allies to work harder to address the lack of linkages that fuel insecurity in this region.”<sup>22</sup>

Mitchell added: “In parallel, the United States supports Romania and its neighbors in their effort at increased regional cooperation. Romania is showing leadership in driving the Three Seas Initiative, which we view as a catalyst for a degree of north-south economic integration and infrastructure long missing in Europe.”<sup>23</sup>

16 William Powell, “Romanian Law Puts Future Gas in Doubt: IOCS,” *Natural Gas World*, July 13, 2018, <https://www.naturalgasworld.com/romanian-tax-makes-production-unlikely-iocs-62737?>

17 “MPs Sent the Gas Companies Back to the Drawing Board. Will They Be Back?”

18 Ibid.

19 Anca Gurzu, Romania’s Black Sea gas sparks political crisis, Politico EU, August 23, 2018. <https://www.politico.eu/article/romania-black-sea-gas-political-crisis-liviu-dragnea/>

20 “Iohannis: Romania Wants to Make Three Seas Initiative Summit More Visible; It is a Profoundly Pro-European Initiative,” *AGERPRESS*, October 3, 2017, <https://www.agerpres.ro/english/2017/10/03/iohannis-romania-wants-to-make-three-seas-initiative-summit-more-visible-it-is-a-profoundly-pro-european-initiative-08-56-25>.

21 Ibid.

22 US Embassy in Estonia, remarks by A. Wess Mitchell, June 18, 2018, <https://ee.usembassy.gov/remarks-by-a-wess-mitchell/>

23 Ibid.

## PART II: TAP, TURKSTREAM, IAP, AND THE GASIFICATION OF THE WESTERN BALKANS

### TAP and its Problems

The Trans Adriatic Pipeline project is vital to Europe's ambitions to bring Caspian and, eventually, Middle Eastern gas to European customers, without relying on existing networks through Russia. TAP is important as an individual project and for the implementation of the €40-billion Southern Gas Corridor developed—and already largely completed—to carry Azerbaijani gas to Europe.

TAP, expected to become operational in 2020, is a planned 878-km pipeline through Greece and Albania to southern Italy. At peak, it is intended to carry some 10 bcm/y of gas to customers in the European Union, notably delivering 8 bcm/y to customers in and beyond Italy.

Since the gas-price collapse in 2014, the pipeline has faced a major conundrum. Its first phase is predicated on contracts concluded in 2013, before prices dropped, to deliver 10.2 bcm/y of gas. However, the line is eventually intended to carry twice as much, and that expansion looks increasingly likely to wind up carrying Russian gas, rather than supplies from rival producers such as Turkmenistan, Iran, northern Iraq, the eastern Mediterranean, or, in particular, a “next wave” of gas from Azerbaijan.

As a result of local protests and regional opposition, reflected in part by the new Italian government's stance, TAP faces problems concerning landfall in Italy.<sup>24</sup>

The onshore sections across Greece and Albania are proceeding apace, with more than three-quarters of the pipe along these 765-km stretches already laid. Indeed, in Albania, as of early September 2018 almost all onshore pipelaying had been completed, including some of the most complicated sections such as the passage through 2,000-meter-high ridges. There is thus no reason to believe that the Greek and Albanian sections will not be completed in time to receive the first gas from Azerbaijan, around the end of 2019 or the start of 2020.

The Italian issue concerns the onward 105-km subsea connection from Fier in Albania—specifically, landfall at San Foca, Italy, and an 8-km section to the receiving terminal. It also involves a 56-km connection from the terminal to Italy's main internal gas-pipeline network, a separate project being developed by Italy's SNAM

gas group and an integral part of the pipeline system. Pipelaying on these sections has yet to start. A key indication of the current Italian government's attitude toward the project will come when the summer holiday season ends, when the TAP consortium is expected to start drilling work on one of the most contentious elements—a 1.6-km microtunnel at the actual landfall site to extend the pipeline under the beach at San Foca.

While the issue of Italian landfall is important in the near term, there is still another major issue that needs to be settled. TAP was envisaged as eventually having physical capacity of around 20 bcm/y. The size and quality of pipe currently being laid can accommodate such volumes; thus, additional compressor units along the route are all that is needed to raise the capacity from 10–20 bcm/y.

This issue is intimately bound up with the question of the Ionian Adriatic Pipeline (IAP), since this project to develop gas distribution in the western Balkans—by connecting Albania to Croatia via Montenegro, and with a spur to Bosnia and Herzegovina—is dependent on receiving gas via TAP at its starting point at Fier, Albania. IAP could also contribute, albeit at considerable expense and with great delay, to an alternative system for conveying gas carried by TAP to customers in and beyond Italy, in the event of any absolute blockage to the TAP landfall in Italy. Prospects for the IAP, which also enjoys significant European backing, are considered subsequently.

### Who Will Fill TAP's Second Phase?

When the final investment decisions for the \$40 billion Southern Gas Corridor projects were being made in 2013, the international gas market was robust enough to justify further investment upstream, so Azerbaijan would have a reasonable prospect of supplying much, or all, of the gas required to ensure the system operated at full second-stage capacity by around 2025 (32 bcm/y as far as western Turkey and 20 bcm/y capacity as far as Italy). This no longer looks feasible. The most important single investment in Azerbaijan's next wave of gas prospects—the wave that follows the current development of the giant Shah Deniz II (SD2) project, which will supply the gas for Phase One of the SGC and TAP—is the

<sup>24</sup> For a full account of this issue, see John Roberts, *Europe's Southern Gas Corridor: The Italian (Dis)connection* (Washington, DC: Atlantic Council, 2018).

effort of France's Total to develop one well at the offshore Apsheron field, with the gas used solely for domestic supply in Azerbaijan. Even as the need for additional gas into the SGC system becomes increasingly important, the only realistic prospects appear to be Turkmenistan, Black Sea production off the Romanian coast, LNG delivered to Greece, and supplies delivered to the Turkish-Greek border by Russia's Gazprom. The first three possibilities are strictly limited in terms of volume (see *Box 3: Prospective and Putative Suppliers of Additional Gas to the SGC*).

### TAP and the Balkans

TAP has a significant role to play in the Balkans regional context when expansion gets under way, and a potentially significant one in the western Balkans even before expansion. It also has a modest, but important, role to play in diversifying supply sources to, and distribution systems through, Bulgaria.

In its expansion phase, TAP will carry up to 20 bcm to yet-unidentified markets. These may be in Western Europe, with deliveries to or through Italy, but some deliveries will likely be to the Balkans. SOCAR, the state-owned Azerbaijani energy conglomerate, which played a major role in developing the SGC, is seeking to develop markets in Bulgaria, Albania, and Montenegro, and is studying proposals for interconnections to the landlocked states of the central Balkans. Addressing a major conference in Baku, Azerbaijan, in May, SOCAR Vice President Elshad Nassirov spoke of “a need to establish markets in the western Balkans” for SGC expansion.<sup>25</sup> TAP is hoping to secure throughput to justify its expansion; should it gain that throughput, some of that gas could be delivered to customers in the Balkans.

Even if it takes years for TAP to convey substantial volumes of gas to the Balkans, it is already playing a significant role. Its implementation makes the question of building the Ionian Adriatic Pipeline up the Adriatic coast to Split, Croatia, reasonable to consider, since the starting point for IAP would be an offtake point on the TAP line at Fier, Albania. If TAP is unable to proceed to Italy, the IAP offers a theoretical alternative.

### IGB: The Interconnector Greece-Bulgaria

TAP is already making one specific contribution to the gasification of the Balkans: the development of the Interconnector Greece-Bulgaria. The IGB was initially designed to carry gas entering Greece via the TAP system or imported as LNG to be delivered to Bulgaria, via

a 182-km, 32-inch line between the TAP offtake station at Komotini in northern Greece and a connection to Bulgaria's gas network at Stara Zagora. Its initial capacity would be 3 bcm/y, with the ability to increase to 5 bcm/y through extra compression.

After years of delay, the project now seems close to implementation. On June 29, 2018, Greek Prime Minister Alexis Tsipras and Bulgarian Prime Minister Boyko Borissov, in the presence of President of the European Commission Jean-Claude Juncker, signed a declaration in Sofia stating that construction would start before the end of 2018, and that the line would be operational in 2020. Other key agreements were also signed in the Bulgarian capital that day. The IGB's operator, ICGB AD, signed an agreement with the TAP consortium on physically connecting the two pipelines, detailing, *inter alia*, the interconnection point, the connecting pipeline, the fiscal metering and regulating station, and fiber-optic cable connection. Another was a memorandum of understanding, under which the European Investment Bank is to provide Bulgarian Energy Holding with €110 million in preferential loan financing for IGB.

These events were hailed as breakthroughs by EU Commissioner for Climate Action and Energy Miguel Arias Cañete, who declared: “The high level political commitment we have witnessed today, for instance with the signature launching the start of construction works on the Bulgaria-Greece gas Interconnector, shows that the EU is serious about completing the energy infrastructure the region needs.”<sup>26</sup>

These developments were followed by the European Commission's July 25 agreement that the IGB would be exempt from EU regulations concerning third-party access for twenty-five years, and by similar exemption approvals given by the Greek and Bulgarian regulators on August 8, 2018. This should help overcome skepticism concerning project implementation, engendered by the fact that the ICGB group actually took an FID on the project—an action that usually marks the start of project implementation—back in December 2015.

Bulgaria may have wished to proceed slowly for two reasons. The first is that it is still looking to secure an arrangement with Gazprom, under which gas from the second string of TurkStream will reach major European markets via Bulgaria. The second is that when the IGB line opens, Bulgaria is also due to start taking delivery of almost 1 bcm/y of gas from Azerbaijan, which will help diversify Bulgarian supply, but not at a favorable price.

25 Elshad Nassirov, SOCAR vice president for Investment and Marketing, comment to the author in Baku, Azerbaijan, May 30, 2018.

26 “Fifth CESEC Meeting,” *Energy Industry Review*, July 10, 2018, <https://energyindustryreview.com/oil-gas/fifth-cesec-meeting/>.

### BOX 3: Prospective and Putative Suppliers of Additional Gas to the SGC

*For a fuller accounting of prospective suppliers see: Europe's Southern Gas Corridor by John Roberts. Chapter in European Gas Markets: Challenges and Opportunities. Editors: Manfred Hafner and Simone Tagliapietra. Palgrave Macmillan, 2017.*

**Romania:** In an ideal world, gas from Romania's new offshore fields will reach European markets via BRUA. But, if BRUA is not available—or if, as a result of fresh discoveries, Romania's gas-export prospects are considerably improved—it might result in gas being transported south to Bulgaria (perhaps via the Trans-Balkan Pipeline, once Gazprom no longer uses it for deliveries to Bulgaria and Turkey), and then via input into TAP.

**Azerbaijan:** There is no doubt that Azerbaijan possesses resources that could provide gas for any second-phase expansion of the SGC and doubling of throughput via TAP. These prospects include Absheron, Umid, Babek, Shafag-Asiman, Sharg, Nakhichevan, and Zafar-Mashal. Significant reserve additions have also been found at the giant Shah Deniz field, and at deep levels under the Azeri-Chirag-Guneshli oilfield.

When the companies developing the SGC were making their final investment decisions toward the end of 2013—a time of relatively high gas prices, and correspondingly enticing market opportunities—BP Azerbaijan President Gordon Birrell declared: “We expect this ability of the Southern Corridor to bring new sources of supply to European markets will extend as additional supplies become available. When I say new sources, I definitely mean additional supplies that can be anticipated with several gas opportunities in Azerbaijan including Shah Deniz Deep, Shafag-Asiman, and Azeri-Chirag-Guneshli (ACG) Deep that are being evaluated by BP and its co-venturers.”<sup>1</sup>

The problem is that market conditions have changed since then. Four years after Birrell's declaration, the two phases of Shah Deniz remain the only gas-export projects under

way, and the key second phase, SD2, is solely geared at providing gas for the first phase of the SGC and TAP. All the other fields currently being developed are focused on the domestic market, including Total's project to transform its discovery well at Absheron into a production well. Moreover, current Azerbaijani gas-development plans (with the exception of SD2) are focused on covering the current shortfall in domestic-supply availability and, over the next few years, developing resources to feed a planned \$7-billion oil-and-gas petrochemical complex.

There is one way in which Azerbaijani gas could still, at least in theory, contribute to increased input into the SGC. Turkey currently imports around 6.5 bcm/y of gas from the original Shah Deniz Project (SD1). This contract is due to expire at the end of 2021 and, in the highly unlikely event that Turkey decided not to renew it, that gas could become available for sale to European customers reachable via an expanded TAP.

**Turkmenistan:** Turkmenistan represents perhaps the most likely option for non-European input into an expanded SGC/TAP system. Malaysia's Petronas Carigali would like to develop the considerable gas reserves it has found at its Block One concession, located in Turkmen waters in the middle of the Caspian. Technically, it would be relatively straightforward for Petronas to produce between 5–10 bcm/y of gas for shipment to the Azerbaijani shore and input into the SGC. Indeed, some of the Petronas wells are located less than 100 km from the Azerbaijani facilities at the Azeri-Chirag-Guneshli oilfield, while the Malaysian company is itself a partner in Azerbaijan's own Shah Deniz gas consortium.

This, however, would require a resolution to regional disputes concerning maritime boundaries in the south Caspian. On August 12, 2018, the five Caspian littoral states took a major step forward when they agreed to a Caspian Sea

<sup>1</sup> “Crunch Time: Energy Interview,” *Business Year*, 2014, <https://www.thebusinessyear.com/azerbaijan-2014/crunch-time/interview>.

The price of Azerbaijani gas is fixed against the dollar. With the dollar having strengthened considerably relative to the euro and other currencies in the five years since the sales agreement was concluded, Bulgaria may wind up paying more than expected—potentially more than for Gazprom deliveries via TurkStream 2.

However, pressure from the EU, coupled with Azerbaijani determination to see the implementation of its sales contract, appears to have overcome Bulgaria's propensity for procrastination. As of mid-August 2018, following a two-month hiatus, the tendering process for pipeline design, materials supply, and actual

construction was once again under way, with bids to be presented by September 10, 2018.

In addition to Azerbaijani gas, Greek shippers hope that the IGB will carry LNG landed at the terminal at Revithoussa and at a projected terminal at Alexandroupolis to Bulgaria, or through Bulgaria to other Balkan markets.

#### The Impact of TurkStream

Gazprom is currently laying a major set of pipelines to deliver gas to Turkey and European customers beyond Turkey, called TurkStream, or Turkish Stream, with

convention, which outlined a common methodology for resolving border disputes. However, actual resolution will still require intense bilateral negotiations, notably between Turkmenistan and Azerbaijan, and between Azerbaijan and Iran, before two of the sea's major boundary disputes can be settled. In terms of cost, supply of Turkmen gas into the SGC/TAP system would almost certainly require Turkmenistan to drop its insistence that all gas produced in Turkmenistan also be processed in Turkmenistan, as this would effectively triple the amount of subsea pipeline required. A senior Azerbaijani official, with considerable experience in the matter, said in July that years of talks between the two countries had failed to yield an agreement, and that Turkmenistan's current attitude does not bode well for the swift development of an interconnector between the two countries' hydrocarbon reserves—even though it would require less than 100 km of pipe to connect Turkmenistan's Block One to the gas-gathering component of Azerbaijan's giant Azeri-Chirag-Guneshli oilfield.<sup>2</sup>

**Iran:** The prime reason why Iran is not likely to contribute gas to any expanded SGC/TAP system in the near future is that it is focused on using as much gas as possible at home, in order to free up oil for export. Connecting to the TANAP element of the SGC would also require construction of a major new pipeline within Iran. Such a line is included in the country's long-term plans; inasmuch as Iran is looking to develop gas for export (apart from neighboring Iraq), it is seeking to do this in the form of LNG from the Gulf.

**Northern Iraq:** The Kurdistan Region of Iraq (KRI) possesses gas resources that could be used to supply the SGC/TAP. But, their development is constrained both by lack of investment—a project based on Turkish investment for major field development and processing at the Miran and Bina Bawi fields has yet to get off the ground—and by strains in the relationship between the Kurdistan regional government and the government of Turkey. Plans

for the export of 10–20 bcm/y to Turkey, expected to start as early as 2018 or 2019, now appear indefinitely postponed. Although a Kurdistan member of parliament said in August 2017 that plans for a gas line to Turkey were in their final stages, it seems reasonable to assume that any gas that reaches Turkey from the KRI will, under current market conditions, be used by Turkey itself. Much will depend on how Russia's Rosneft sees the prospect for development of its newly acquired fields in Kurdistan.

**The Eastern Mediterranean:** Any gas seeking to enter European markets from the eastern Mediterranean must essentially use one of three prospective delivery systems: by sea in the form of LNG processed at existing liquefaction facilities in Egypt; via Turkey and a connection to the SGC/TAP; or via around 1,800 km of proposed new pipeline to Greece and Italy. A connection through Turkey seems improbable so long as tensions over Cyprus remain unresolved. The proposed East Mediterranean Pipeline is likely to prove a nonstarter under current market conditions, even though it has been officially included in the European Commission's list of Projects of Common Interest since 2015. Initial EU cost estimates (there have been no full feasibility studies so far) of €6.2 billion (with a 30-percent variation) appear far too low for a project of great technical complexity, since it would have to be laid in some places at depths of up to 3,000 meters and, because of the pressure, could carry no more than 10 bcm/y. At present, evacuation of eastern Mediterranean gas to European markets looks most likely to be carried out in the form of LNG from Egypt.

**Russia:** Because of its development of TurkStream, and the availability of gas in the form of upstream resources that have already been developed and are ready for export, Russia's Gazprom looks to be the only prospective supplier into TAP on a similar scale to the 8 bcm/y currently scheduled for delivery to Italy (and beyond) from Azerbaijan.

2 Senior Azerbaijani official, comment to the author, Baku, Azerbaijan, July 17, 2018.

the goal of ensuring Gazprom can serve customers in Southern Europe without reliance on the existing Brotherhood pipeline through Ukraine.

The system consists of two “strings,” referred to as TurkStream 1 (TS1) and TurkStream 2 (TS2), with the first string intended to supply Turkey and the second to supply other European countries. Gazprom reports that the world's biggest pipelaying vessel, the *Pioneering Spirit*, has laid the first line and, having previously laid the second line as far Russia's exclusive economic zone (EEZ) boundary with Turkey, is currently laying the section in Turkey's EEZ.

There is no reason to doubt Gazprom will have in place a line capable of fully replacing the 12–14 bcm/y of gas that currently reaches Turkey through Ukraine and the Trans-Balkan Pipeline by the time its current transit agreement with Ukraine ends at the end of 2019. Gazprom officials have repeatedly said they do not intend to transit gas across Ukraine once the agreement expires, although there is some debate as to whether it might need to continue using Ukraine for some deliveries to Central Europe after that date—particularly as it looks unlikely that Nord Stream 2 will be operational by then. However, TS1 could completely replace deliveries to Turkey, while TS2 can take over delivery



A cat rests among pipes meant to be used for construction in terminated South Stream gas project, stored in the Black Sea port of Varna, Bulgaria, March 27, 2018. Picture taken March 27, 2018. *Credit: REUTERS/Stoyan Nenov.*

requirements for other Gazprom customers in southeastern Europe, notably Bulgaria and Greece.

TurkStream TS1 and TS2 will each have a capacity of 15.75 bcm/y, meaning TS2 will not only be able to supply Gazprom's existing customers in southeastern Europe, but will have considerable surplus capacity—perhaps as much as 10 bcm/y—for shipment beyond southeastern Europe to customers further afield, notably Italy.

Surprisingly, even though pipelaying on TS2 looks likely to be completed in 2018, it is not clear where it will make landfall on the Black Sea's western shoreline. It will almost certainly land at Kiyıköy, where TS1 will reach the shore, but it is possible that Gazprom may opt for a landfall around 100 km further north, near the Bulgarian port of Varna. The doubts concerning landfall go to the heart of the issues that TS2 raises in connection with European gas supply. There is no point in Gazprom laying such a big pipeline at considerable expense, unless it can be assured of onward delivery from the western coast of the

Black Sea to mainstream European markets. The entire TurkStream project is estimated to cost around \$7 billion, but that does not count the more than \$15 billion needed to get the gas from Russia's main producing areas to its dispatching point at the Black Sea port of Anapa.

### **Gazprom's Options for Onward Deliveries to Europe**

Gazprom is laying its TurkStream 2 pipeline with the seeming assumption that it will carry around 3 bcm/y for Greece, 3 bcm/y for Bulgaria, a little for Macedonia, and the rest for established customers farther west. Gazprom has three options to serve these customers and has engaged in direct discussion with prospective partners on two of them. The first of the two routes considered publicly is a route to the northwest that would, in effect, implement much of the original South Stream project, which Gazprom appeared to abandon when President Vladimir Putin announced TurkStream during a December 2014 visit to Turkey. This would

involve developing a pipeline system through Bulgaria, Serbia, and the northern Balkans to a terminal, either at Baumgarten in Austria or Tarvisio in northeast Italy.

Gazprom has signed various initial agreements with transit countries, demonstrating it is at least studying such an export route. If Gazprom were to develop such a route, TurkStream 2 could logically either make landfall in or have an onshore connection to Bulgaria. However, there are reasons to question the seriousness of such an approach. Diplomatic sources assert that the registered address of a Gazprom affiliate supposedly working on development of transit through Bulgaria is just an empty apartment.<sup>27</sup> Likewise, a request to Serbian authorities for a twenty-five-year exclusion from third-party access has come from another previously unknown apparent Gazprom affiliate, Gastrans LLC, which was due to send an analysis of its request to the Serbian regulator by mid-2018.<sup>28</sup>

Gazprom has also held discussions with energy officials in Greece and Italy about a second potential route, effectively a revival of the Interconnector Turkey-Greece-Italy (IGTI/Poseidon). Since the interconnector between Turkey and Greece opened in 2007, it is essentially a realization of the Interconnector Greece-Italy (IGI) project, a 590-km pipeline across Greece to a terminal at Florovouni on the Ionian coast near Igoumenitsa, and implementation of the Poseidon project for a 207-km subsea pipeline from Florovouni to a landing point near Otranto in southern Italy. Gazprom has discussed the revival of this project with the Italian company Edison and the Greek energy regulator DEPA, with the three parties signing an MoU in February 2016 and a cooperation agreement in June 2017.

However, these projects would both cost a considerable amount of money, and it is not clear whether Gazprom could find entities to help fund their development. An onshore project from the Bulgarian coast through Serbia to Baumgarten or Tarvisio could be expected to cost at least \$7 billion. Gazprom might seek to reduce costs by using the existing Trans-Balkan Pipeline in reverse, to carry gas north out of Turkey and into

Bulgaria. Whether it would be able to secure continued access to this Soviet-era system, which it currently uses to carry gas southward to Turkey, remains unclear.

As for the development of a new trunkline across Greece, and an attendant crossing of the Ionian Sea to Otranto, this could cost at least as much as TAP—currently estimated at €4.5 billion—and probably more. Landfall in Otranto, some 20 km south of TAP’s project landfall, would—or should—involve tackling the same environmental problems TAP has encountered, concerning olive-tree removal and avoiding the offshore subsea *posidonia oceanica* meadows.<sup>29</sup>

A third option is to use the TAP pipeline currently under construction between the Turkish-Greek border and southern Italy. TAP is being built in accordance with strict European regulations, which require that while the initial phase of 10 bcm/y is solely allocated to gas from Shah Deniz, any capacity expansion must be open to competition from any supplier that can make the most competitive offer. At present, none of the original prospective sources of additional gas envisaged by the developers of the SGC system in 2013 seems likely to contribute gas into an expanded system until perhaps 2025. However, Gazprom could put as much as 10 bcm into TAP as soon as TurkStream 2 is completed. In a striking comment in January 2017, Gazprom Vice President Alexander Medvedev indicated, for the first time, that his company might be considering using TAP.<sup>30</sup> Considering using TAP would cost Gazprom little, and there are few other suppliers in a cash-constrained gas market, it would be logical for Gazprom to utilize TAP rather than spend billions of dollars for new infrastructure. This is rather ironic, given that TAP and the Southern Gas Corridor were envisioned as helping provide Europe access to non-Russian supply.

A hint concerning the method by which TurkStream might connect with TAP emerged, somewhat cryptically, in a September 2017 declaration in Turkey’s official *State Gazette*, which announced the Turkish cabinet had ratified an intergovernmental agreement with Greece allowing for the development of the ITGI/

27 Private comment to the author, March 2018.

28 See Energy Community Secretariat, *The State of Gas Market Integration in the Energy Community: Special report for the CESEC High Level Group Meeting* (Vienna: Energy Community Secretariat, 2018), pp. 10-11, [https://www.google.com/url?sa=t&rct=j&q=&src=s&source=web&cd=2&ved=2ahUKEwiC-YzQgY7dAhVK5awKHY1WChMQFjABegQICRAC&url=https%3A%2F%2Fwww.energy-community.org%2Fdam%2Fjcr%3A97524dfe-7ae9-4c83-83a3-52eca0d3eff1%2FCESEC\\_CESEC\\_062018.pdf&usq=AOvVaw0qDcM7PWni\\_D5ZXRpjklol](https://www.google.com/url?sa=t&rct=j&q=&src=s&source=web&cd=2&ved=2ahUKEwiC-YzQgY7dAhVK5awKHY1WChMQFjABegQICRAC&url=https%3A%2F%2Fwww.energy-community.org%2Fdam%2Fjcr%3A97524dfe-7ae9-4c83-83a3-52eca0d3eff1%2FCESEC_CESEC_062018.pdf&usq=AOvVaw0qDcM7PWni_D5ZXRpjklol).

29 See Roberts, *Europe’s Southern Gas Corridor: The Italian (Dis)connect* for further consideration of this issue.

30 Alexander Medvedev, comments at European Gas Conference in Vienna, January 24, 2017. According to the interpreter, and therefore as heard by the audience, Medvedev referred to “the Poseidon project, which will be ready soon.” He told the author immediately afterward that he had said, in Russian, that the studies for the Poseidon project would be ready soon.

Poseidon natural-gas transit line between Turkey, Greece, and Italy.<sup>31</sup> The announcement basically ratified an agreement concluded more than a decade earlier, which had already resulted in the 2007 opening of the Interconnector Turkey-Greece, a direct gas pipeline between Karacabey, Turkey, and Komotini, Greece.

Although the immediate reaction to the *State Gazette's* announcement was that this meant a full revival of the ITGI/Poseidon system, a different interpretation seems probable: that the ratification clears the way for *any* connection from Turkey to Greece. This would allow for a short new connection across the border from Turkey into Greece, to enable TurkStream to join up with TAP inside Greece. The connection would take place at the same Ipsala/Kipoi border crossing as the junction between the TANAP and TAP pipelines, which constitute two of the key elements of the SGC system.

### Russia and the TAP Open Season

Russian use of TAP is contingent on EU approval for TAP, based on the proviso that while the initial operating phase can be reserved exclusively for SD2 gas, the expansion phase must allow open access. One of the leading SGC participants in the long-drawn-out saga of development and gas sales, SOCAR Deputy Vice President Vitaliy Baylarbayov, stressed in July 2018: “We do not make any exception or discrimination concerning the source of supply, so long as the supplier is legitimate and wishes to use our system in accordance with the relevant EU regulations.”<sup>32</sup> Baylarbayov said TAP’s developers were looking to attract input from producers in the Middle East, Central Asia, or the eastern Mediterranean. “Of course we are interested in attracting new sources of gas into the SGC,” he said.<sup>33</sup>

Nonetheless, Russian gas would not be able to enter an expanded TAP for about four years, as TAP needs to hold an “open season”—expected at the end of 2019—to solicit interest from prospective shippers interested in the capacity expansion. It would take about a year to firm up shipping contracts, and another year to negotiate permits for the expansion activities, followed by six or seven months during which extra compression would be added to the system. Any gas for delivery to Italy or the Balkans as part of TAP’s expansion plan would probably not reach its market until mid-2022. This does not square neatly with Gazprom’s current pipelaying program for TS2, but Gazprom has shown it is prepared to be patient; after all, it left the pipes ordered for its abandoned South Stream project on the quayside at Varna, Bulgaria, for the better part of three years until it could use them in the TurkStream project.

There is one other modest possibility—a ramp-up period for the gas being produced in Phase Two of the Shah Deniz gas field. During this period, before plateau production is reached in or around 2022, there may be some spare capacity available within the existing TAP system. This raises the possibility, however faint, that Gazprom might consider forwarding gas landed in Turkey to customers in the European Union before any TAP expansion is undertaken.

In the Three Seas context, TAP serves as an anchor for both gas development and transportation in countries bordering the Black Sea and the Adriatic. But, in order to maximize its practical usefulness, gas must be able to flow north through the IGB and through an enlarged Bulgaria-Romania connection in the east, and through an Ionian Adriatic Pipeline in the west.

31 David O’Byrne, “Turkey Clears ITGI to Greece, Opens Way for TurkStream,” *Natural Gas World*, September 19, 2017, <https://www.naturalgasworld.com/turkey-approves-itgi-poseidon-link-with-greece-paving-way-for-link-with-turkstream-55400>; and “Agreement to Bolster Gas Transfer between Turkey, Greece and Italy,” *Daily Sabah*, September 19, 2017, <https://www.dailysabah.com/energy/2017/09/19/agreement-to-bolster-gas-transfer-between-turkey-greece-and-italy>.

32 Vitaliy Baylarbayov, interview with the author, Baku, Azerbaijan, July 18, 2018.

33 Ibid.

## PART III: THE IONIAN ADRIATIC PIPELINE AND GASIFICATION IN THE WESTERN BALKANS

The Ionian Adriatic Pipeline, still a prospect rather than a project under actual development, is beleaguered by politics and the difficulty of ensuring it can operate commercially. For all its potential to enhance regional, and even European, energy security, it still has some way to go before physical construction can begin. Nonetheless, a company is being set up to develop the project.

IAP has two main roles; it is an extension or backup to TAP, and a means of ensuring gasification of the western Balkans. Addressing the Caspian Oil and Gas Conference in Baku in May, TAP President Walter Peerner said: “Southeast Europe is one of the regions that can benefit most from the Southern Gas Corridor,” adding, “we can connect to most of the western Balkans via the Ionian Adriatic Pipeline.”<sup>34</sup> In a Three Seas context, the IAP would serve as a core element linking TAP to both the western Balkans and, through a connection to the Croatian network, to gas hubs in Central Europe.

Support for the IAP is strongest in the three countries that are the least gasified—and have the smallest actual requirement for gas. Albania wants it to revive gasification, which stalled when its own gas resources were depleted in the Communist era; Montenegro wants to receive gas, so it can start gasification; and Bosnia and Herzegovina wants to reduce its dependence on Russian imports. At a major political forum in May 2017, Bosnian Deputy Foreign Minister Josip Brkić noted Bosnia and Herzegovina is the biggest electricity producer in the Balkans, generating hydro and coal power, and exporting surplus production. He added, “But we are 100 percent dependent on the natural gas pipeline coming from Russia—and we are very interested in developing the Ionian Adriatic Pipeline.”<sup>35</sup>

The IAP is currently envisaged as a system to distribute 5 bcm/y among four countries: Albania would utilize 1 bcm/y; Montenegro, 0.5 bcm/y; Bosnia and Herzegovina, 1.0 bcm/y; and Croatia, 2.5 bcm/y. The line would start at the connecting point with the TAP at Fier, in southern Albania, and terminate at Split, where it would connect with the main Croatian distribution system. This would enable some gas to flow from TAP to Croatia, but the critical question is how much it could carry. Its basic design capacity is just 6.5 bcm/y, but a January 2014 feasibility study completed by Denmark’s COWI indicated that this could be increased to as much as 10 bcm/y if shippers showed suitable interest. This interest can be measured through the “open season” procedure, by which applicants can seek access to specified infrastructure.<sup>36</sup> If IAP were to be developed as a 10-bcm/y system, it would then have the same capacity as TAP, enabling it to serve as an effective alternate distribution system, should TAP fail to achieve landfall in Italy.

Constructing the IAP would require laying some 168 km of pipeline in Albania, 94 km in Montenegro, and 249 km in Croatia. There would also be a 22-kilometer connection between an offtake point in Croatia and the existing gas-pipeline system in Bosnia and Herzegovina. Because IAP was conceived as a system to deliver gas from TAP into the western Balkans, all sections would be capable of reverse flow, thus enabling gas arriving in northern Croatia to flow south to Albania. As one recent study has noted, Albania and Montenegro have no commercial gas markets, while markets in neighboring Macedonia and Bosnia and Herzegovina are tiny.<sup>37</sup>

A company is being set up to develop the project, which should be completed by September 2018. The intention to form such a company was announced

34 Walter Peerner, address to Caspian Oil and Gas Conference in Baku, Azerbaijan, May 30, 2018, author’s notes.

35 Josip Brkić, address to the Global Security Forum in Bratislava, Slovakia, May 27, 2017, author’s notes.

36 See COWI and IPF Consortium, “FS and ESIA for the Ionian Adriatic Pipeline (IAP) Feasibility Study Report,” January 2014, p. 42. “It is predicted that the initial transit flow amounts to 5 bcm per year. This may be subject to increase up to 10 bcm depending on the market needs, which can be also clarified during the Open Season procedure. However, flow simulations will be conducted in line with the results of the economic analysis.”

37 Julian Bowden, “South Eastern Europe Gas Markets—Moving Towards Integration” in Christopher Jones (editor), *The Role of Gas in the EU’s Energy Union* (Deventer, Netherlands: Claeys & Casteels, 2017), [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwjcovfInI7dAhUGKqwKHZ1xB9EQFjAAegQIABAC&url=http%3A%2F%2Fclaeys-casteels.com%2Findex.php%3Froute%3Dproduct%2Fproduct%2Fdownload%26pdf%3D1%26document\\_id%3D60&usg=AOvVawOG227GLpm0aiZkxkyLN8nQ](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwjcovfInI7dAhUGKqwKHZ1xB9EQFjAAegQIABAC&url=http%3A%2F%2Fclaeys-casteels.com%2Findex.php%3Froute%3Dproduct%2Fproduct%2Fdownload%26pdf%3D1%26document_id%3D60&usg=AOvVawOG227GLpm0aiZkxkyLN8nQ).

in a letter of intent, signed by the gas companies of the three principal countries to be served by IAP—Croatia’s Plinacro, Albania’s Albgaz, and Montenegro’s Montenegro Bonus—during the February 2018 meeting of the Southern Gas Corridor’s Advisory Council in Baku. Azerbaijan’s SOCAR, while not a formal member of the proposed company, is providing technical assistance for both company formation and actual pipeline development. “By September (2018), IAP member countries will have created a project company, and this will be a very big step in the development of the project,” the director of the SOCAR Balkan company, Murad Heydarov, has said. (See also, *The Role of SOCAR, below.*)

### The EU and the IAP

The IAP is currently caught up in a bureaucratic mess concerning the number of sponsors required for it to be a project of common interest (PCI) for either the European Union or the Energy Community, and, thus, its eligibility for financial assistance. The project was deemed eligible for inclusion when the European Commission listed it as Project 6.21 in its 2013 list of two hundred and fifty PCIs, but there was no mention of IAP in a revised November 23, 2017 list of one hundred and seventy-three projects. It had fallen afoul of updated European requirements requiring the project to have a significant impact on at least two EU countries, as IAP only directly impacts one, Croatia.<sup>38</sup> The rest of its direct impact is in countries that are not EU member states. But they are members of the Energy Community and, as such, they are committed to adopting the EU’s energy rules and regulations. They also aspire to EU membership. The EU now considers the IAP a project of mutual interest (PMI)—a far lower status, particularly where financing is concerned.

In the case of Montenegro, this is particularly ironic. As the head of the Energy Community, Janez Kopač, acknowledged in an address in Ljubljana, Slovenia, in September 2017, “Montenegro is the most disciplined member of the Energy Community. It has transposed the [European Commission’s] Third Energy Package

into its legislation in its entirety.”<sup>39</sup> Montenegrin officials at that meeting noted that their main focus was securing the physical infrastructure to connect the country with its neighbors.

### Costs and Commerciality

IAP is estimated to cost a bit more than €600 million, making it only marginally viable, though significant measures could improve the project’s commercial viability and its role in providing regional energy security.<sup>40</sup>

Although both the original 2014 feasibility study by Denmark’s COWI and a report published in February 2018 by UK-based Economic Consulting Associates (ECA) concluded that IAP is only marginally commercially viable, several significant measures could both radically improve the pipeline’s commerciality and enhance its role in the provision of regional energy security.

The ECA report sums up the issue as follows: “IAP can play an important role in the gasification of Montenegro and Albania and importantly in providing a north-south axis into the EU and Croatia for the Southern Corridor diversifying supplies for the EU and other West Balkan countries (e.g., Bosnia-Herzegovina). Recent developments have provided further impetus for the project including a recovery of gas prices, Croatian gas demand recovery, the development of TAP and the relatively low cost prospect of expansion and ambitious gasification strategies for both Albania and Montenegro.”<sup>41</sup>

The ECA report goes on to say: “Despite these positive developments, our assessment is that the project remains commercially marginal. Under our standard throughput scenario, the transmission tariffs would at best be 2.7 €/cm, which is above our estimated critical threshold level of 1.9 €/cm. Although this tariff would yield a regulated return of 8% on assets, the IRR (internal rate of return) would only reach 4.7%.”<sup>42</sup>

ECA listed several strategies that IAP project developers could pursue to improve the project’s viability. The most important is demonstrating that Croatia itself

38 These requirements currently state: “To become a PCI, a project must have a significant impact on energy markets and market integration in at least two EU countries, boost competition on energy markets and help the EU’s energy security by diversifying sources, and contribute to the EU’s climate and energy goals by integrating renewables. The selection process gives preference to projects in priority corridors, as identified in the TEN-E strategy.” TEN-E is the European Union’s Trans-European Networks for Energy. European Commission, “Projects of Common Interest,” <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest>.

39 Janez Kopač, address to Energy Community Gas Forum in Ljubljana, Slovenia, September 20, 2017, author’s notes.

40 The costs of the IAP were estimated by COWI in 2014 at €617.5 million. In February 2018, the London-based Economic Consulting Associates estimated the cost at €611.0 million. These contained the usual provisos that they spanned a range; in the ECA case, it was plus or minus 20 percent.

41 Economic Consulting Associates, “Final Report Task 2—IAP Feasibility, February 2018. Submitted to: The World Bank, the Energy Community Secretariat, the European Western Balkans Joint Fund under the Western Balkans Investment Framework,” p. 120.

42 *Ibid.*, p. 120.



Pipes for the construction of the TAP pipeline through Albania, taken in September 2017. As of September 2018, pipelaying for the onshore portion through Albania is nearly complete. *Credit: John Roberts.*

constitutes a key market, and would play a crucial role in transmission to markets served by hubs like the Central European Gas Hub at Baumgarten. The ECA argues that Croatia, “as the only well-established and sizeable gas market connected to IAP will therefore play a crucial role as an anchor offtake markets over the first five to ten years of operation.”<sup>43</sup> Although gas accounts for one quarter of Croatia’s energy mix, the south and coastal parts of the country—in effect, the coastal strip south of Split and the Dubrovnik area—currently lack any significant gas supply.

However, because the Croatian gas market is currently in a slump, with demand flatlining and a recovery necessary before it can serve as the anchor market for gas carried by the IAP, in practice the core issue is international transmission through Croatia. The report argues: “As the offtake markets along the IAP route are likely

to develop slowly and Croatia’s import demand is facing gas-on-gas competition, international transmission for EU markets beyond Croatia—particularly at initial stages of development—will be of utmost importance for IAP’s viability. If this cannot be ensured, pipeline tariffs will be too high for IAP to provide competitive gas supplies.”<sup>44</sup>

More generally, it adds: “Besides gasifying the countries in the West Balkan region, IAP could also supply EU gas markets beyond Croatia. This means that it can act as a major component of the EU’s Southern Gas Corridor. Gas could be delivered all the way to the Central European Gas Hub (CEGH) at Baumgarten in eastern Austria through the Croatian, Hungarian and Slovenian networks. This would mean that in theory the entire European market can be supplied by IAP (through swaps or other trading mechanisms).”<sup>45</sup>

43 Ibid., p. vii.

44 Ibid., p. viii.

45 Ibid., pp. 35–36.

The markets to be accessed via Croatia are, principally, Austria, Hungary, and Slovenia—and those served by hubs such as Baumgarten. In 2017, Austrian annual demand stood at 9.0 bcm and Hungary's at 9.9 bcm.<sup>46</sup> Slovenia's annual demand is around 0.8 bcm, while Croatian demand stood at 2.7 bcm in 2015.<sup>47</sup> However, in order to access these markets, the ECA study notes that the Croatian transmission system will need to be expanded and developed to accommodate what it termed “maximum international transmission volumes to provide access to other established EU gas markets.”<sup>48</sup> At present, Croatian transmission-system operator Plinacro believes the Croatian system can handle around 2.6 bcm/y of additional transmission to Hungary, while improving transmission to Slovenia would require a further €60-million investment.<sup>49</sup> Although the agreement on the Croatia-Hungary interconnector specifically referenced the IAP, Hungary's ambassador-at-large for energy, Pal Sagvari, has commented: “Post-2020 we have a lot of contracts expiring with Russia and we need to make alternative arrangements, we need to consider best transit options. It's important to have reserve flow with Croatia, ditto with Slovenia. We need to open up our market—but IAP is not the first project that comes into our mind.”<sup>50</sup>

### The Scope and Size of the IAP

These elements raise two major issues concerning IAP. The first is the fact that if IAP is to gasify the region and play a role in transmission on a larger scale, it should really be considered as three projects. It is initially structured as a local transit line, for gas to be delivered from TAP via Albania to Montenegro, Bosnia and Herzegovina, and southern Croatia. It then becomes a regional line, serving a broader region as gasification proceeds in the western Balkans. Even so, it remains quite a modest project, with the ECA report envisaging a slow ramp-up from just 1 bcm in 2025 to 3 bcm in 2035, and only reaching 5 bcm in 2050.

Finally, it becomes a much bigger regional transit line, carrying gas north to Central Europe, notably to Baumgarten. However, delivery to Baumgarten, or markets currently served through Baumgarten, requires IAP to operate with competitive tariffs to be on par with

alternative supply routes for Caspian and Middle East gas. In this context, the ECA report states: “As Croatia and potential EU markets to the north of Croatia will be the key offtake markets at initial stages of development, IAP will have to provide gas at a more competitive price than existing sources or at least be more competitive than alternative routes of supply from Caspian and Middle Eastern gas (e.g., through the Italian transmission system).”<sup>51</sup> The report therefore estimates the upper limit for IAP transmission tariffs at 1.9 euro cents per cubic meter, in line with similar costs for transporting gas from southern Italy to Croatia via Slovenia.

At a May 2017 Energy Community workshop on the western Balkans in Vienna, ECA Managing Director Fred Beelitz said that IAP's commercial feasibility would depend heavily on Croatian demand and transit flows in the short run, but that, in the longer term, it needed to serve as a transmission system. He argued: “Demand beyond Croatia will be crucial. A key driver in the region will be distributed demand. But distributed demand takes a long time to develop. It's a gradual development. But invest in a pipeline and you want a quick return, so you look to the Croatian market, a mature market, and European customers.”<sup>52</sup> It is absolutely crucial in the first ten years, Beelitz argued, to fill the pipeline with transmission gas to reach markets beyond Croatia. IAP, he added, “has an important security-of-supply component.”<sup>53</sup>

The second question concerns capacity. As the IAP is currently designed as a 32-inch line with an optimal capacity of around 6.5 bcm/y, it will need to be scaled up if it is to serve as a major artery for delivery of Caspian and Middle Eastern gas to Central Europe and hubs such as Baumgarten. A 36-inch line can easily handle 10-15 bcm/y, depending on the terrain and the distance between compressor stations. As noted earlier, the difference between a 32-inch pipeline and a 36-inch pipeline is minimal in terms of cost, but substantial in terms of volume carried. However, it should be noted that the Croatian system north of Split is based on 32-inch pipes, so this system will also need to be augmented. For their part, Plinacro officials do not consider this a problem, and believe that capacity can be increased through debottlenecking. There is some understanding among

46 See consumption figures in BP, “BP Statistical Review of World Energy.”

47 Economic Consulting Associates, “Final Report Task 2.”

48 *Ibid.*, p. viii.

49 *Ibid.*, p. 32 and p. 40.

50 Pal Sagvari, address in Vienna, May 24, 2018, author's notes.

51 Economic Consulting Associates, “Final Report Task 2,” p. viii.

52 Fred Beelitz, comments at workshop in Vienna, May 24, 2018, author's notes.

53 *Ibid.*

the IAP partner countries that the terms of reference and the scope of the project could need to be changed from the parameters set out in the 2014 COWI feasibility study, while the problems facing TAP's landfall in Italy provide additional justification for a fresh look at both TAP's prospective role and its design capacity.

The ECA report makes other recommendations intended to improve the commerciality of the IAP. It notes that feeder connections to Bosnia and Herzegovina and Kosovo can reduce tariffs. However, it also specifies that the connection to Bosnia and Herzegovina has to serve existing power plants and that, in order to significantly boost the IAP's feasibility, it also has to displace the existing supply route, an apparent reference to gas coming from Russia. Overall, the report argues that it is gas supply to the non-power sector—particularly the replacement of electricity and fuel oil in the heating sector—that does the most to improve the IAP's economic feasibility and produces the largest benefits to the region. “It is therefore important to combine the IAP project with an extensive gasification plan of residential and commercial customers if the project is to achieve economic feasibility,” the study says. “However, even if only targeted at the power sector, the project would be economically feasible.”<sup>54</sup>

Operationally, the ECA report recommends that the Croatian section of the IAP should be integrated into the Croatian asset base, while the Montenegrin and Albanian sections should be treated as an international pipeline. This, it argues, “consistently shows the lowest tariffs across all sensitivity and throughput cases.”<sup>55</sup> It adds that this “is also the only business model—in combination with high throughput assumptions—that provides a tariff below €1.9c/cm,” the threshold for ensuring competitive gas supply.<sup>56</sup> ECA officials say that this does not change ownership of the line in any way; it is simply a means to secure the best tariff structure.

### The N-1 Energy Security Issue

The IAP fulfils a critical energy security role in the European Union's own policy of ensuring that national gas supplies meet the N-1 (N minus One) criterion,

which requires the provision of alternative arrangements should a primary energy supply be curtailed for any period of time. The COWI feasibility study included a key section required by the EU itself: a security-of-supply analysis “to evaluate the benefit of the IAP regarding the significant improvement of the N-1 criterion for Croatia, Bosnia & Herzegovina, Montenegro and Albania individually and for the region of South East Europe as well.”

COWI found that “development of IAP pipeline directly influences and either enables or increases N-1 criterion of Albania, Montenegro and Croatia.”<sup>57</sup> It noted that a “bi-directional IAP seems to be the only viable gas supply option for Montenegro guaranteeing [sic] meeting N-1 criterion.”<sup>58</sup> It stated that IAP would enable Croatia to satisfy the N-1 criterion until 2030, and that development of southern interconnection and pipeline branches toward neighboring countries would enable Bosnia and Herzegovina to both develop its gas market and meet the N-1 criterion. Overall, it concluded that “on the regional level IAP represents very important part of least cost gas supply option meeting N-1 criterion. Albania, Montenegro and Croatia are directly supplied with Caspian gas coming from TAP with IAP pipeline, Kosovo and Bosnia and Herzegovina would be supplied with the IAP branch pipeline, while FYR of Macedonia and Serbia can be supplied with IAP gas indirectly over the future Kosovo and Croatia gas transmission system.”<sup>59</sup>

IAP would secure the gas supply and energy security of three NATO member states—Albania, Croatia, and Montenegro—and also enable the development of a broader energy market that can tap into Albania's ability to store gas. Due to its history of gas production, Albania has about 1 bcm of storage availability in depleted gas fields, and the potential to develop a further 2–4 bcm of storage in salt caverns. This could serve as a strategic reserve for the western Balkans, as well as for all the countries served by the TAP line, including Italy.

### The Energy Community and Inconsistent Support

In the three years since the Energy Community's Central and South-Eastern European Gas Connectivity

54 Economic Consulting Associates, “Final Report Task 2,” p. xiii.

55 Ibid., p. x.

56 Economic Consulting Associates, “Final Report Task 2,” p. x.

57 COWI and IPF Consortium, “FS and ESIA for the Ionian-Adriatic Pipeline (IAP) Feasibility Study Report.”

58 Ibid.

59 Ibid.

(CESEC) High-Level Group published its Action Plan, listing seven priority projects, it has still not changed its lukewarm stance that “other pipelines such as the Ionian Adriatic Pipeline (IAP) or the interconnector Romania-Serbia, not yet considered, will be part of the next phase of the CESEC initiative.” CESEC, EU officials acknowledge, was set up in response to Russian President Vladimir Putin’s December 2014 revival of the South Stream project in the form of Turkish Stream. CESEC, one EU official said recently, “is not hard policy; it is very much politically driven.”<sup>60</sup> Its remit was to pick projects already identified as priority, and focus on those that had to be implemented in the near future.

When the CESEC Action Plan was first presented at a July 2015 gathering of senior European ministers and energy officials in Dubrovnik, Croatia, it became clear that, even though the European Commission had funded COWI’s extensive feasibility study, the IAP was not one of the seven priority projects. It took a near walkout by the Albanian delegation to prompt the last-minute addition referencing its inclusion in the previously unplanned “next phase” of the CESEC initiative.

In a time of relatively low prices and constrained cash resources, the Energy Community is concentrating on developing the software to improve transborder gas transmission, rather than on the physical infrastructure, such as pipelines. This has involved efforts to harmonize network codes for cross-border pipelines, during which the IAP has lost traction. This may well prove a major mistake, as the project not only serves to bring gas to populations without access to it and provide competition for populations dependent on a single supplier, but is also a significant strategic project. Advocates in Albania stress IAP’s importance in helping to cement their country in a European—and, specifically, NATO—framework.

This is not to say that the Energy Community’s focus on gas-market software is misplaced. The creation of a continental-scale gas market, with a variety of hubs and a multiplicity of supplies, depends just as much on getting agreement on cross-border regulatory structures as on the physical infrastructure. The Energy Community is already achieving considerable success in this area, securing the agreement of five EU member states—Poland, Hungary, Romania, Bulgaria, and Greece—that they are now “committed to respect and to implement network codes on the border with Energy Community

contracting parties, as soon as these contracting parties will implement that network code.”<sup>61</sup> This means that, for example, Romania will implement common network codes with Serbia, once the Energy Community has approved Serbia’s own network code. The same goes for Bulgaria with Macedonia and Serbia; Greece with Macedonia; and Hungary with Ukraine and Serbia.

Yet, much of the hardware—the interconnectors between Balkan states—is still missing. Southeast Europe remains a collection of island markets that need to be linked together. Some interconnector proposals have secured PCI status, others have not, and even PCI projects remain undeveloped. CESEC itself is a recognition of the horsepower needed to secure actual delivery.

Political support for the IAP seems inconsistent. Albanian authorities are divided as to whether their priority is to achieve a connection that would serve Montenegro, Bosnia and Herzegovina, and southern Croatia by means of IAP, or to demonstrate their support for fellow ethnic Albanians by establishing gas pipelines to Macedonia and Kosovo. The plans drawn up by COWI for the core north-south connection in Albania serve both sides of this argument, since they envisage a trunkline between the IAP connection with TAP at Fier and the northern Albanian city of Shkoder, where the IAP route would then head northwest to Croatia, while an offshoot to the northeast would serve the northeastern Albanian city of Kukes before crossing the border into Kosovo. Albania’s gas masterplan proposes a connection to Macedonia via an offshoot from TAP at Korçë, just inside the Albanian border with Greece; this is currently under consideration by TAP.

On the other hand, when the foreign ministers of Croatia, Montenegro, and Albania met in July 2018 for their Third Adriatic Trilateral Meeting, they not only reportedly described the IAP as a project of “paramount importance” in terms of strengthening the energy independence of Southeastern Europe, but also agreed to work jointly toward including Montenegro and Albania in the Three Seas Initiative, stating that this was one of the most important mechanisms for fostering security and economic development in Central, Eastern, and Southeastern Europe.<sup>62</sup>

The need to ensure the IAP’s commerciality means the key to resolving this conundrum lies with the European

60 EU official, comment to the author, May 2018.

61 Janez Kopač, comment to the author, Ljubljana, Slovenia, September 20, 2017.

62 Coordinating Secretariat for Maritime Issues 16+1, “The Third Adriatic Trilateral Meeting of the Ministers of Foreign Affairs was Held in Budva, Montenegro,” July 31, 2018, <http://ceec-china-maritime.org/blog/the-third-adriatic-trilateral-meeting-of-the-ministers-of-foreign-affairs-was-held-in-budva-montenegro/>.

Commission, since the development of the IAP requires financial support and grant aid. Tirana's natural desire to help fellow ethnic Albanians in Kosovo and elsewhere in the Balkans would, in practice, best be achieved through the development of the IAP, since this is the only project with the ability to secure broad-based regional gasification. If such gasification should take place in Albania, Montenegro, Bosnia and Herzegovina, and southern Croatia, it is relatively straightforward to develop spurs to the east to serve Macedonia, Kosovo, and, perhaps, Serbia.

The European Commission clearly understands that European energy security requires cooperation between EU and non-EU states. As one official has said: "We cannot have a Swiss-cheese approach that focuses just on EU member states. There is a need for projects that are important not just for the European Union, but for Energy Community countries in the western Balkans as well."<sup>63</sup> The question is whether this will translate into practical financial support for those countries that are not (yet) members of the EU, such as Albania, Montenegro, and Bosnia and Herzegovina.

### The Role of SOCAR

Azerbaijan's SOCAR has a significant role in securing the development of the IAP, not least because it sees the western Balkans as a prospective market for future exports of Azerbaijani gas. It is a member of the IAP Project Management Unit established by the energy ministries of Albania, Bosnia and Herzegovina, Croatia, and Montenegro, together with specialist companies from each country. SOCAR's inclusion is significant for several reasons. SOCAR largely handled the export-sales agreements that underpin the entirety of the \$40-billion complex of Southern Gas Corridor projects. It was also involved in developing a goodwill agreement that resulted in a 2013 memorandum of understanding with the governments of Albania, Montenegro, Bosnia and Herzegovina, and Croatia, to ensure TAP and IAP were developed in alignment with one another. Moreover, in August 2016, the four governments signed a further MoU with SOCAR on the construction of the IAP. Of course, an MoU does not automatically lead to actual implementation, but it

demonstrates Azerbaijan's interest in ensuring access to current and prospective gas markets in the western Balkans. The ECA's Fred Beelitz, in his separate presentation in Vienna in May 2018, specifically described SOCAR as IAP's "engineering consultant."<sup>64</sup>

Baku also concluded an MoU in November 2017 with Tirana on implementation of Albania's gas masterplan. SOCAR also has significant commercial interests in Montenegro, and is helping Bulgaria expand its gas-distribution system.

### Financing the IAP

While IAP could improve regional, and even European, energy security, commercial viability questions mean that much of the line must either be built by the public sector or will need to secure grants for much of its construction costs—up to 50 percent, or €300 million, by some estimates.<sup>65</sup> The European Commission will have to provide substantial grant aid, which will not be easy, as three of the four countries involved are not in the EU.

While European funds have helped pay for IAP studies, there has been no indication of whether the European Commission would fund construction work.<sup>66</sup> Much depends on whether the IAP can regain PCI status—preferably for the sections in all four countries, but at least for the section in Croatia—to reduce the funding gap. Meanwhile, it seems reasonable to envisage funding as follows:

- Albania: Total investment costs: €192.1 million. The WBIF commonly provides grants of around 15 percent of investment costs, so Albania might expect to secure €28.8 million.
- Montenegro: Total investment costs: €120.9 million. At a 15-percent WBIF grant level, Montenegro might expect to secure €18.1 million.
- Croatia: Total investment costs: €298.0 million. The EU's Connecting Europe Facility (CEF) commonly provides 50-percent grants, so Croatia might expect to secure around €149 million.

This means that the three countries constituting the core of the IAP, with the Bosnia and Herzegovina spur considered separately at this stage, might expect to

<sup>63</sup> EU official, comment to the author.

<sup>64</sup> Beelitz, comments at workshop in Vienna.

<sup>65</sup> In its study published in February 2018, the ECA considers that grant funding of more than 50 percent is required, arguing that "the share of grant funding for IAP that would bring the tariffs to a competitive level in the base case scenario is 60% (€370 million) and 50% in the good case (€300 million)." However, in his presentation in May, ECA Managing Director Fred Beelitz said that "perhaps as much as €250 to €300m" in grants would be required to ensure a competitive transmission tariff, and that the €370 million figure should be disregarded. Only in ECA's most optimistic gas-throughput scenario—of high transit levels, significant IAP penetration in the Croatian market, and rapid gasification efforts in Albania, Montenegro, and Bosnia and Herzegovina—would no grant funding be needed.

<sup>66</sup> The Council of Europe Development Bank (CEB), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) all contribute to WBIF activities.



U.S. President Donald Trump, Polish President Andrzej Duda and Croatian President Kolinda Grabar-Kitarovic take part in a family photo along with other heads of states and delegates during the Three Seas Initiative Summit in Warsaw, Poland July 6, 2017. *Credit: REUTERS/Carlos Barria.*

secure a maximum of €195.9 million if the project were to secure PCI status.<sup>67</sup> But, this would still leave the three countries around €110 million short of necessary grant aid to ensure commercial operations in a low-throughput scenario.

Croatia is pushing to get the IAP back on the PCI list, which is revised every two years, but the EU is highly cautious. The criteria for inclusion on the PCI list changed between publication of the first list in 2013, which included IAP, and subsequent lists in 2015 and 2017, which did not. Also, EU officials argue, these later lists did not include IAP because it was not thought to contribute

sufficiently to EU priorities at that time. EU priorities are focused on greater network integration, the “software” aspect of European energy-market integration. EU officials have said energy security is currently a very important element in the EU’s assessment of such projects, possibly indicating an avenue for a fresh approach when considering assessments for the 2019 PCI list.<sup>68</sup>

On the other hand, the EU appears to be looking primarily to the development of a commercial model for the IAP, with one official commenting: “It’s very important to provide the proper financing for the engineering part. You can have a project that is mature from

67 The role of Bosnia and Herzegovina in developing the IAP is complex. The main pipeline has to cross some 10 kilometers of Bosnian territory, or must otherwise be laid across Bosnian waters, since Bosnia and Herzegovina’s tiny coastline at Neum separates the southern districts of Croatia from the rest of the country. For Bosnia and Herzegovina, the real question is whether IAP’s development will be accompanied by a feeder line to serve mainstream markets in Bosnia-Herzegovina. Current IAP plans incorporate a 22-km spur from Zagvozd In Croatia to Posušje in Bosnia-Herzegovina. But the real question is whether a further 165 kms of pipeline can be laid in Bosnia-Herzegovina to reach Tomislavgrad, with a spur down to Mostar, and then Novi Travnik, where it would connect to the existing system that supplies gas to Sarajevo. The Energy Community has reported it would cost around €116 million. See: Energy Community, “Bosnia and Herzegovina-Croatia South Interconnector,” <https://www.energy-community.org/regionalinitiatives/infrastructure/PLIMA/Gas03.html>.

68 EU officials, private discussions with the author, 2018.

a technical and engineering point of view, but if you don't have a commercial model, you don't have the finance available as well."<sup>69</sup>

As for the actual provision of grant-aid funding from the CEF, the official was equally cautious, repeating the European Commission's mantra on eligibility for PCI status and declaring: "The EU budget is about 1 percent of EU GDP and energy is just a small portion of budget, so it has to be very carefully selected, to choose those projects that can really make a difference. PCIs have to have a cross-border dimension, which has an impact on at least two member states and have costs and benefits in proportion in the same member states."<sup>70</sup> This is not a particularly encouraging message for the IAP's promoters, particularly in light of the ECA report's clear argument that the provision of grant-aid finance is required in the first place to ensure the IAP is able to operate on a commercial basis.

This is not a unique problem. One veteran analyst of such projects has commented: "Often these projects are sub-economic in early years, so financing can be difficult initially."<sup>71</sup> The analyst added: "In talking about commercial interest, that may be a long-term goal, but in the interim the EU is going to have to do a lot of pump priming. Otherwise in ten years' time we are still going to be looking at the same projects on the PCI lists."<sup>72</sup> With regard to prospective longer-term commercial investors in the IAP, this also underpins the ECA's argument that it should not treat the project as a standalone investment, but as part of a portfolio of assets.

Overall, if the IAP is to be built, it seems that its sponsors and supporters will likely have to look elsewhere to bridge the initial funding gap. It would be logical to involve potential gas suppliers, with SOCAR as a natural choice. Should the SGC secure input from other Caspian and Middle Eastern suppliers, those suppliers might consider it in their interest to aid IAP development, in order to boost their access to European markets.

### IAP: Conclusions

IAP is an important project, commercially and politically. It can both prompt energy cooperation and enhance

energy security in the western Balkans, initially through spurs from Croatia to Bosnia and Herzegovina, from Albania to Kosovo, and, subsequently, through potential extensions from Kosovo to Serbia and Macedonia, and its integration into a Balkans gas ring. However, IAP proponents are concerned that the project is seen by other governments, notably Bulgaria and Romania, as a competitor to BRUA, since it would have the potential to enable at least some gas volumes carried in TAP to reach European markets via the IAP and Croatia, instead of via BRUA and Austria.

There is also the argument that IAP effectively closes the ring, ensuring that once BRUA is fully operational from Bulgaria to Austria, there will be a gas ring around the Balkans—consisting of BRUA to the north, IAP to the west, TAP to the south, and connections from TAP to BRUA, such as the IGB, to the east. Such a ring, together with smaller interconnectors inside it, would ensure that all of the Balkan countries—including the landlocked states of Serbia, Kosovo, and Macedonia—are capable of being supplied with gas on a competitive basis. Moreover, closing the ring ensures a full connection between countries bordering the Adriatic and Black Seas, and enhances energy connections with countries further afield—particularly if the Three Seas Initiative can contribute to the development of a substantial two-way pipeline system to connect Croatia and Hungary with Poland.

In a December 2017 interview, European Commission Vice President for Energy Union Maroš Šefčovič, declared: "The completion of the Southern Gas Corridor and the supply with gas from Azerbaijan could potentially be an important alternative energy carrier to the entire Western Balkans. We, therefore, work closely together with our partners from the Energy Community Secretariat in Vienna in order to facilitate the development of domestic natural gas infrastructure and necessary interconnection facilities in the region."<sup>73</sup>

However, he did not say how the EU might help finance the IAP, and it is hard to see how the IAP could be developed without substantial EU grants. Without IAP, it is no less difficult to envisage how Šefčovič and the Energy Community can facilitate the regional gasification and interconnection facilities they so desire.

69 Private conversation.

70 Private conversation.

71 Analyst, private conversation with the author, May 2018.

72 Ibid.

73 "Good Progress Achieved on All Projects Along Southern Gas Corridor—Šefčovic," *Trend News Agency*, December 18, 2017, <https://en.trend.az/business/energy/2836903.html>.

## PART IV: THE KRK ISLAND LNG PROJECT

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In theory, the long-drawn-out saga of the project to develop an LNG regasification terminal at Krk Island in Croatia is finally coming to an end. In practice, nothing is settled until a final investment decision is made.

The project epitomizes the contrast between commercial and energy security interests in developing significant energy infrastructure. In energy security terms, Krk Island has two major potential roles. First, it has the ability to diversify gas-supply sources for Croatia and its neighbors, not least by enabling them to access LNG from the United States. Second, in a Three Seas context, it constitutes the southern anchor of a north-south gas pipeline system that would connect the Polish LNG import station at Świnoujście on the Baltic with Krk on the Adriatic. A joint Polish-Romanian policy report in early 2018, *The Emergence of a European Project: Three Summits for the Three Seas Initiative*, identified such a connection as one of two macro projects—the other being BRUA—that could deliver on 3SI objectives to create energy links. “Both can qualify as very important initiatives of the cooperation framework and aim to ensure a greater diversification of energy inputs not only for the 3SI region itself, but also for the entire European Union,” the report said.<sup>74</sup> One approach to creating such a corridor between Świnoujście and Krk can be found in the Atlantic Council’s *Completing Europe: Gas Interconnections in Central and Southeastern Europe—an Update* (see pp. 27-33, “The Backbone Concept Revisited”).<sup>75</sup>

However, particularly as the time approached for the Croatian authorities to make the crucial final investment decision on Krk, it became increasingly clear that the most immediate issue concerned the project’s commerciality.

The Krk Island LNG project was originally conceived as a 6-8-bcm/year onshore terminal. Then it was to be located offshore, with a floating storage-and-regasification unit (FSRU) capable of handling 2.6 bcm/y. Per a fresh tender issued in June 2018, the project is now envisaged as having an initial capacity of just 1.5 bcm/y.

If the tender and an open season for use go well, the all-important final investment decision will be made very quickly. At one stage, it was thought possible that it might be reached as early as August 2018. But, a decision to extend a call for bids for output to September 28 now points to the decision on whether to proceed with an FID being made in or around the last quarter of 2018. The project has already secured €124 million in EU aid, including €101.4 million from the EU’s Connecting Europe Facility. This is enough to cover half the cost of securing the FSRU vessel, and one-third of the project’s estimated total cost, suggesting it should go ahead. The EU views the Krk Island project as part of its core strategy of integrating Central European gas markets and boosting regional energy security. However, as commercial constraints grow tighter in an era of moderate gas prices and rising gas-on-gas competition (in contrast to higher prices and reduced competition when the project was being pushed eight or ten years ago), the reluctance of some Croatian authorities to push the project has resulted in its initial scale being steadily reduced, with a consequent reduction in its ability to improve European energy security.<sup>76</sup>

By August 2018, events were moving at a very fast pace. April brought the shocking news that Barbara Dorić, the president of the Croatian Hydrocarbon Agency, had replaced Goran Frančić as head of Croatia LNG, the group developing the project. Frančić had held the job for just eighteen months. Three days later, the company announced a delay to the second, and binding, round of the open season seeking customers to lease capacity at Krk. In a statement, LNG Croatia explained: “Taking into account that in the first round we received requests to extend the period for preparing bids and that potential users of the terminal are still studying the local gas market regulations, we decided to move the opening of the second round to June 22.”<sup>77</sup> This appeared a polite way of saying that the company had only received one binding offer to lease space—a bid from Croatian energy conglomerate INA, for a mere 100 million cubic meters per year (mcm/y), just

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74 Kamil Calus, Horia Ciurtin, and Gheorghe Magheru, *The Emergence of a European Project: Three Summits for the Three Seas Initiative* (Bucharest: New Strategy Center and OSW, 2016), [https://newstrategycenter.ro/wp-content/uploads/2016/04/NSC\\_OSW\\_3SI\\_policy\\_paper.pdf](https://newstrategycenter.ro/wp-content/uploads/2016/04/NSC_OSW_3SI_policy_paper.pdf).

75 John Roberts, *Completing Europe: Gas Interconnections in Central and Southeastern Europe—an Update* (Washington, DC: Atlantic Council, 2014), [http://www.atlanticcouncil.org/images/publications/Completing\\_Europe\\_web\\_0915.pdf](http://www.atlanticcouncil.org/images/publications/Completing_Europe_web_0915.pdf).

76 LNG Croatia LLC, “Invitation to Submit Bids,” [https://www.lng.hr/lib/plugins/kcfinder/upload/files/019-18-LNG\\_ENG.pdf](https://www.lng.hr/lib/plugins/kcfinder/upload/files/019-18-LNG_ENG.pdf).

77 “Croatia Delays Bidding Round for LNG Terminal Capacity to Late June,” *Reuters*, April 23, 2018, <https://af.reuters.com/article/energyOilNews/idAFL8N1S0511>.

one-tenth of the minimum Croatia LNG was thought to be seeking to justify project implementation.<sup>78</sup>

In May, the company issued details of its revised tender for an FSRU, together with terminal operation and maintenance, which would initially be expected to handle just 1.5 bcm/y. The company said: “It was necessary to revise the technical characteristics and capacities of the initially requested FSRU to reduce the initially planned capital costs of the project and enable the realization of the project with a lower capacity booking.”<sup>79</sup> Croat sources say LNG Croatia is looking to secure a smaller, older, and cheaper vessel to serve as the FSRU. Even so, there is a concern that prospective tariff revenues may not prove sufficient to cover the costs, and there will still be a need for some public finance from the Croatian government, the European Union, or both. As of mid-August 2018, the closing date for submission of bids for the FSRU itself was set for August 24, 2018, and the closing date for bids for output from the Krk Island facility was set for September 28, 2018.

On June 14, Croatia’s unicameral parliament passed the Law on the Terminal for Liquefied Natural Gas, commonly dubbed the Lex LNG. After weeks of heated debate, and vocal opposition from local communities on Krk Island and nearby mainland districts, the law passed by a vote of 75–25.<sup>80</sup> One week later, LNG Croatia published its rules for operating the LNG terminal, and the next day, June 22, finally opened the binding second round of its open season procedure to assess buyers’ and shippers’ concrete interest in booking capacity at the terminal for the whole twenty years of the project.<sup>81</sup> Days later, a formal invitation was issued for operators to submit bids for procurement and delivery of an FSRU and provision of operational and maintenance services.<sup>82</sup> The deadline for submitting binding offers to secure gas via the terminal is currently set as September 28, 2018, with hopes to receive bids for around 500 mcm/y from Croatia. If so, as one Croatian source puts it, “that leaves one bcm for Hungary; let’s see if the Hungarians are interested.”<sup>83</sup> Simultaneously, the company needs to arrange

construction of a jetty and a connecting pipeline, and these will require engineering, procurement, and construction contracts.

If Krk LNG is to be operational on schedule by the start of 2020, everything will have to be accomplished on a very tight timetable. This means all onshore construction works and facilities required to receive incoming LNG vessels must be completed by the end of 2019.

There is considerable imbalance between the limited commercial interest in Krk LNG and the role some of its supporters thought it could play in enhancing European energy security. But, so long as it goes ahead—and the provision of the CEF’s €101.4-million grant in December 2017 should be a major factor in ensuring this goal—it could play a small initial role, and then grow into a bigger one as Croatia’s energy market becomes increasingly integrated with its neighbors, particularly Hungary.

Other issues also need to be addressed. In mid-2018, negotiations were under way to secure additional partners for LNG Croatia. The company’s current partners are HEP, Croatia’s electricity company, and Plinacro, which operates Croatia’s natural-gas transmission system and is also, in parallel with the development of Krk LNG, responsible for developing the connecting pipeline to Croatia’s distribution network. A bunker station in Rijeka will also be required. If the project succeeds in the long term, the goal is to retrofit Croatia’s shipping fleet, to build a fleet of LNG feeder vessels, and to encourage use of LNG inland.

In addition to overcoming limited commercial interest, Krk LNG must also satisfy Croatian environmentalists’ concerns that use of chlorine at the facility will damage the environment in the surrounding waters. Croatia LNG believes its environmental-impact assessment, approved in March 2018, answers these fears. However, as with the problems concerning TAP’s landfall in Italy, issues that start out as environmental sometimes turn political, and EIA assessments provide no answer for that outcome.

78 “Croatia Reportedly Receives Just One Bid to Lease Capacity at Planned LNG Terminal,” *bne IntelliNews*, April 15, 2018, <http://www.intellinews.com/croatia-reportedly-receives-just-one-bid-to-lease-capacity-at-planned-lng-terminal-140000/>.

79 LNG Croatia LLC, “Invitation to Submit Bids.”

80 “Parliament Adopts LNG Terminal Law,” *Total Croatia News*, June 14, 2018, <https://www.total-croatia-news.com/business/29093-parliament-adopts-lng-terminal-law>.

81 LNG Croatia LLC, “Rules of Operation of Liquefied Natural Gas Terminal,” June 2018, [https://www.lng.hr/lib/plugins/kcfinder/upload/files/Rules%20of%20operation%20of%20liquefied%20natural%20gas%20terminal\\_21062018.pdf](https://www.lng.hr/lib/plugins/kcfinder/upload/files/Rules%20of%20operation%20of%20liquefied%20natural%20gas%20terminal_21062018.pdf).

82 LNG Hrvatska, “Call for the Submission of Binding Offers in the Second Round of the Open Season Procedure,” <https://www.lng.hr/en/news-details/call-for-the-submission-of-binding-offers-in-the-second-round-of-the-open-season-procedure-90>.

83 Private comment to the author, May 2018.

## CONCLUSION

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The projects considered in this report contribute to the ultimate objective of both the European Union and the Energy Community: a gas grid that functions smoothly and effectively throughout the region. They also constitute significant elements in the development of a functioning system of interconnectors that would link the Black, Adriatic, and Baltic Seas. However, while they are necessary, they are not sufficient, since the software for such grids—the development of network codes and their alignment across borders—is equally important.

So, too, is the willingness not only to adopt common or complementary rules and regulations, but to abide by them. As the head of the Energy Community, Janez Kopač, said in March: “The biggest challenge is how to invoke the rule of law. There is a lot of disrespect (in the region) for the rule of law.”<sup>84</sup>

Moreover, there is a paradox. Developing all four of the systems that are prime focuses of this report—BRUA, TAP, IAP, and the Krk LNG terminal—would serve to integrate the European market, bolster the Three Seas Initiative, improve the continent’s energy security, and benefit consumers across Europe. However, they also risk being in competition with each other for markets, and—at a time when the commerciality of the IAP and Krk LNG projects is low—they face competition for investment funds.

The principal competition could be between BRUA and IAP, with Krk LNG posing a lesser challenge. BRUA and IAP stand to gain from “first-mover advantage,” as whichever is developed first can secure markets for throughput in Central Europe or at Baumgarten. Hungary’s stalling on BRUA could yet prevent Romanian Black Sea gas from accessing such markets, leaving the field open to IAP. On the other hand, IAP might either fail to develop or be developed so tardily that some other element—perhaps Russian gas delivered by the Nord Stream 2 system—secures these markets.

For Krk, much would depend on how it is used. If it follows the classic pattern set by many of Europe’s LNG-receiving terminals, which commonly operate at around

one-quarter of their potential capacity, it would primarily be required for short-term supply to cover seasonal fluctuations. However, if it constitutes the basis for long-term delivery supplies, such as to Hungary, it would come into competition with IAP and BRUA.

This leads to two key conclusions.

First, it is absolutely crucial for European and national institutions to view commercial and energy security considerations on a truly European basis, rather than through a narrow national lens. Second, there needs to be a great deal of grant aid or highly concessional funding to secure the development of such infrastructure. In this context, the Three Seas Initiative can play a crucial role, since its focus is as much on the need to ensure regional energy security as on the commerciality of the links required to connect the countries of the Baltic, Adriatic, and Black Seas.

This is particularly true in the Balkans, which, in terms of gas, effectively constitute a collection of small markets that cannot necessarily support the cost of large-scale interconnectors. In particular, development of the IAP requires around half of its funding to come from grants, while BRUA has already received concessional financing, and Krk Island will need a combination of both. This issue is acknowledged by at least some EU officials, with one noting recently that there have been no investment grants in the gas-infrastructure sector to date, but only technical assistance, and that “in the next years we have to concentrate far more on financing.”<sup>85</sup> Likewise, although the European Commission issued a ringing declaration in Sofia on May 17, 2018—calling for its Energy Union to be extended to the western Balkans, and describing this as part of its flagship policy for EU enlargement—the only example it cited of financial support for an energy project in the region concerned aid for an electricity interconnector between Albania and Montenegro.<sup>86</sup>

If BRUA, IAP, and Krk all proceed as they should, this will go a long way toward securing the gasification of the Balkans, particularly the western Balkans. The completion of these three projects in or around 2020 will also contribute significantly to the goal of various EU member states, notably Poland, of ensuring that

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84 Janez Kopač, comment made during the Central and Eastern European Gas Conference in Zagreb, Croatia, March 7, 2018, author’s notes.

85 EU official, private comment to the author, May 2018.

86 European Office in Kosovo, “Sofia Declaration of the EU-Balkans Summit,” May 17, 2018, [https://eeas.europa.eu/delegations/kosovo/44794/sofia-declaration-eu-western-balkans-summit\\_en](https://eeas.europa.eu/delegations/kosovo/44794/sofia-declaration-eu-western-balkans-summit_en).

gas can flow freely between the Three Seas. And, if problems concerning Hungary are resolved, they will go a long way toward achieving the goal of substantial gas-pipeline interconnections between the Three Seas.

That said, more will still need to be done. The IAP is required not only for gasification in the western Balkans, but also to serve as a backup system for regional energy security, particularly if the problems concerning TAP's landfall in Italy are not resolved. There is still a need to ensure that existing and planned pipeline systems and interconnectors in Central Europe are capable of ensuring that, if necessary, Caspian gas can flow north from TAP into Central and Northern Europe, and that liquefied or piped gas entering Poland can flow south to the Balkans via BRUA and, ideally, the IAP.

Once the Three Seas are connected with bidirectional pipelines, that will leave only one major regional gas-security issue still to be resolved: the use of the major trunk pipelines developed by Gazprom's antecedents in the Soviet era, once Gazprom implements its policy to halt gas transit via Ukraine in or after 2019. The answer will largely depend on events in Ukraine itself, including whether the reform movement there—epitomized by the new generation currently managing Naftogaz Ukraine—wins out against a corrupt, but entrenched, establishment. But that is another story.

The projects assessed in this study will not be the last major gas-infrastructure projects undertaken in Europe, but they indicate that the era of massive projects is approaching its end. They are all being undertaken at a time of relatively low gas prices, and each of them needs to justify its completion.

- BRUA is required both to provide a modest degree of flexibility in the eastern Balkans and, perhaps more importantly, to provide an export system for Romania's offshore gas fields.
- TAP is so far advanced that it is simply too late to halt it completely, although there is a possibility that it might have to terminate in Albania.
- The IAP and Krk Island LNG terminal are relatively modest projects that contribute to regional energy security and the expansion of gas usage in the western Balkans. They only really become essential in a Europe-wide context if TAP is prevented from making landfall in Italy.

- As for TurkStream and Nord Stream 2, their rationale is fundamentally political: to provide Russia with alternative ways of supplying existing customers without reliance on the existing major gas lines across Ukraine.

Major institutions, such as the European Commission and the Energy Community, are currently focusing much more on regulatory issues than on the construction of major new infrastructure. Indeed, where new infrastructure is required, the focus is generally on small-scale local interconnectors. Some major and intermediate projects may yet be needed, but this will be to fill specific niches. Poland, fearing the loss of direct supply from Russia, will continue to work hard to advance its plans for the 10-bcm/y Baltic Pipeline, to ensure direct delivery of piped Norwegian gas to Poland. Likewise, there is still considerable logic underpinning the concept that a cluster of small-scale interconnections in Central Europe needs to be scaled up to develop a system that can deliver some 10–15 bcm/y of gas on a north-south axis between the Baltic and the Adriatic—thus ensuring that both Poland's LNG terminal at Świnoujście and the planned Croatian LNG terminal at Krk Island are part of a flexible gas-transmission system.<sup>87</sup>

While projects in the Baltic have succeeded in balancing commerciality and energy security, the same is not yet true in the Balkans. Work on BRUA is under way, and TAP is almost complete. Yet, both still face problems—the former with Hungary, and the latter in Italy. The issue of how to make IAP and Krk island LNG commercial propositions remains acute. Collectively, these four projects epitomize the most crucial question for both European gas companies and their governments: Who pays for the social and environmental benefits to be gained from gasification and for European energy security?

This, in turn, poses a fundamental question about the Three Seas Initiative in the context of creating new energy connections between the Baltic, Adriatic, and Black Seas. Are the governments that favor such a development willing and able to secure the funds needed to bridge the gap between commercial and energy security requirements? As Janez Kopač, the director of the Energy Community, noted at the Central and Eastern European Gas Conference in Zagreb on March 7, 2018, “You need to have commerciality, but there is a bit of premium that needs to be paid for energy security.”<sup>88</sup>

<sup>87</sup> John Roberts, *Completing Europe: Gas Interconnections in Central and Southeastern Europe* (Washington, DC: Atlantic Council, 2016), Appendix: The Backbone Concept Revisited, <http://www.atlanticcouncil.org/publications/reports/completing-europe-update>.

<sup>88</sup> Kopač, comment made during the Central and Eastern European Gas Conference in Zagreb, Croatia.

## ABOUT THE AUTHOR

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**John M. Roberts** is a UK-based senior fellow at Atlantic Council's Eurasia Center and Global Energy Center. He is also a member of the UN Economic Commission for Europe's (UNECE) Group of Experts on Gas and a senior partner with Methinks Ltd, a consultancy specializing in the interrelationship between energy, economic development, and politics. He has a particular expertise in the development of energy in the Caucasus and Central Asia and in the pipelines connecting or intended to connect the Caspian to China, Russia, India, and Europe.

Roberts is one of Europe's leading energy security specialists. He served as a managing editor at Platts for twelve years, and previously with Financial Times Energy, focusing on the development of energy and on the impact of energy on development. In assessing global energy security issues, he has regularly toured the Gulf and the Caspian, as well as visiting the Alaskan North Slope, the Athabasca Tar Sands, China, Norway, and Venezuela.

He has also testified to UK parliamentary committees on Turkish, Russian, Caspian, and Mideast energy security issues. He is currently researching European energy security issues, including the contribution of natural gas to a global renewables-led energy revolution; the role of Turkey in European energy security; Russian gas deliveries to Europe; the development of new supply pipelines and interconnectors within Europe; and the energy security implications of gas discoveries in the Eastern Mediterranean. He is also preparing a study on the triangular gas relationship between Russia, China and Central Asia.

He has lectured widely on a variety of subjects, including the development of Arctic oil and gas, the impact of social and political unrest in the Middle East and boundary disputes in the Caspian Sea. In September 2015 he delivered the inaugural lecture, *What is Energy Security?* at the NATO Training School's Energy Security Course in Oberammergau, Germany.

Roberts has completed studies for the Atlantic Council on oil and gas in the Kurdistan Region of Iraq, on gas interconnectors in Europe, and on the development of Russia's Turkish Stream pipeline and its impact on the development of the Southern Gas Corridor to connect the Caspian to Europe. He has also contributed to various studies on oil and gas development in the Eastern Mediterranean. His paper *Europe's Southern Gas Corridor: The Italian (dis) Connection* will be published by the Atlantic Council this fall.

Recent contributions to collated studies include: *Regional Energy Cooperation along Europe's Southern Energy Corridor*. Chapter 12 in *The South Caucasus: Security, Energy and Europeanization*, Eds. Meliha B. Altunisik and Oktay F. Tarrisever. Routledge, January 2018. *The Southern Gas Corridor*, Chapter 14 in *The European Gas Markets: Challenges and Opportunities*. Eds: Manfred Hafner and Simone Tagliapietra. Palgrave Macmillan, November 2017.

His books include *Caspian Pipelines* (1996), *Visions & Mirages: The Middle East in a New Era* (1995), and *Beyrouth: L'Été '82 (Beirut, Summer of '82)* (1983).



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