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# Developing a Western Energy Strategy for the Black Sea Region and Beyond



Ariel Cohen

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Cover photo credit: Osman Orsal/Reuters. An oil tanker passes through the Bosphorus to the Black Sea in Istanbul, Turkey.

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## EXECUTIVE SUMMARY

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Since Russia's annexation of the Crimea, the future of the Black Sea and Caspian energy corridor has been in doubt. The West needs to develop a comprehensive policy for securing energy exploration, production, and transportation between the Caspian Sea basin and Europe. To address these challenges, NATO should boost its presence in the Black Sea basin and expand naval and air force cooperation with Romania, Bulgaria, and Ukraine. Turkey, a Black Sea power, should also play an important role in this endeavor.

The European Union (EU) must create better conditions for dialogue among its members, as their varied levels of dependence on Russia for gas and different approaches to nuclear energy continue to present serious obstacles to Central and Eastern European regional energy security, including the Black Sea region. Both the United States and the EU should oppose, or at least try to limit in scope, construction of Gazprom's Turkish Stream gas pipeline from Russia to Turkey, while supporting oil and gas development around the Black Sea, including in Georgia, Romania, and Ukraine.

In order to minimize the Kremlin's influence on Southeast Europe's energy sector, the EU should:

- expand the network of gas interconnectors in the Black Sea and Central and Eastern Europe, which would allow import of gas in the South-North, North-South, and West-East directions, thus diminishing dependence on Gazprom;
- lift government restrictions on the exploration and production (E&P) of nonconventional resources, such as shale gas and liquefied natural gas (LNG);
- establish a favorable tax regime for companies operating in E&P; and
- focus on the development of oil, gas, coal, and nuclear power. While renewables are critical for meeting the CO2 emission targets and can enhance long-term energy security in the region, hydrocarbons will shape the industry for years to come.



## DEVELOPING A BLACK SEA ENERGY STRATEGY

The United States and NATO need to recognize that Black Sea energy security directly affects the ability of the region's countries to withstand the pressure that the Russian Federation applies to them through price gouging and the disruption of gas supplies.

The US State Department's Bureau of Energy Resources, ably headed by Special Envoy Amos Hochstein, should take the lead in developing and implementing a coherent US policy that will ensure that the region is secure for energy transportation, exploration, and production, so that no one power is allowed to dominate the energy chess board.<sup>1</sup> However, the State Department cannot and should not do it alone. It needs to cooperate with the Pentagon, the Department of Energy, and the intelligence community. Most importantly, the United States needs to expand cooperation with its European allies in addressing these issues.

With respect to pipeline development and use, an important goal should be keeping the Turkish Stream project from increasing the amount of Russian gas that reaches Europe, as long as the Ukraine crisis remains unresolved. The United States and its European allies should support development of the Southern Gas Corridor, as well as the North-South Gas Corridor in Central Europe, to improve natural gas supplies to South and Central Europe. The United States and Europe should also prioritize the development of other alternative sources of natural gas, including from Georgia, Ukraine, Romania, the Black Sea basin, Kurdistan, the Eastern Mediterranean, and beyond.

## THE BLACK SEA BASIN AND EUROPE'S ENERGY SECURITY

Russia's natural gas leverage over countries in the Black Sea basin and in Central, Southeastern, and Eastern Europe has become a recognized challenge for European energy security. Countries that acquire most of their supply from the Russian Federation have become the most vulnerable. In 2006 and 2009, Bulgaria, Croatia, Greece, Slovakia, Ukraine, and other countries experienced abrupt interruptions of Russian gas supply during a cold winter. The Kremlin uses energy not just as a commodity to earn cash, but also as a means of increasing political interdependence—occasionally at the highest levels, as in the case of Gerhard Schröder, the former Chancellor of Germany, who chairs the board of Gazprom's Northern Stream gas pipeline and regularly heaps praise on Vladimir Putin.<sup>2</sup> Hungary and the Czech Republic experience the Kremlin's economic power and influence as well, including a \$10 billion credit to Budapest

to build Russian nuclear plants.<sup>3</sup> The last twenty-five years have demonstrated that Moscow can and does use its energy muscle to impose its foreign policy agenda on European countries that import a large share of their natural gas from Gazprom, which is over 50 percent state-owned by Russia.<sup>4</sup>

The Russian militarization of the Black Sea since the annexation of the Crimea is turning the region toward a Cold War-style confrontation, which, in turn, further increases risks to South-Central Europe's energy supply. If a conflict flares up, Moscow could hold the area's energy supply hostage—yet another sign that excessive dependence on Russian gas is a security risk the region can ill afford.

Russia is already using the Baltic Sea as an important transit waterway for its North Stream pipeline complex. Moscow is now eyeing the Black Sea as a route to supply European countries with its natural gas via Turkey<sup>5</sup>—as a symmetrical and parallel reflection of the North Stream, which allows Russian gas to bypass Ukraine.

**RUSSIA'S NATURAL GAS LEVERAGE OVER COUNTRIES IN THE BLACK SEA BASIN AND IN CENTRAL, SOUTHEASTERN, AND EASTERN EUROPE HAS BECOME A RECOGNIZED CHALLENGE FOR EUROPEAN ENERGY SECURITY.**

Another parameter critical to understanding the situation is the level of political commitment demonstrated by the Gazprom-supplied countries dependent on Russia for energy. As shown in figure 1, in 2013, Belarus and Armenia received 100 percent of their natural gas from Russia at prices lower than those paid by other Eastern European countries. They are also Moscow's most loyal allies. On the other hand, Bulgaria, where Gazprom accounts for almost 100 percent of domestic gas consumption, pays the full market price for the gas it receives from Russia, as the government in Sofia has opposed South Stream, the

1 US Department of State, "Bureau of Energy Resources," <http://www.state.gov/e/enr>.

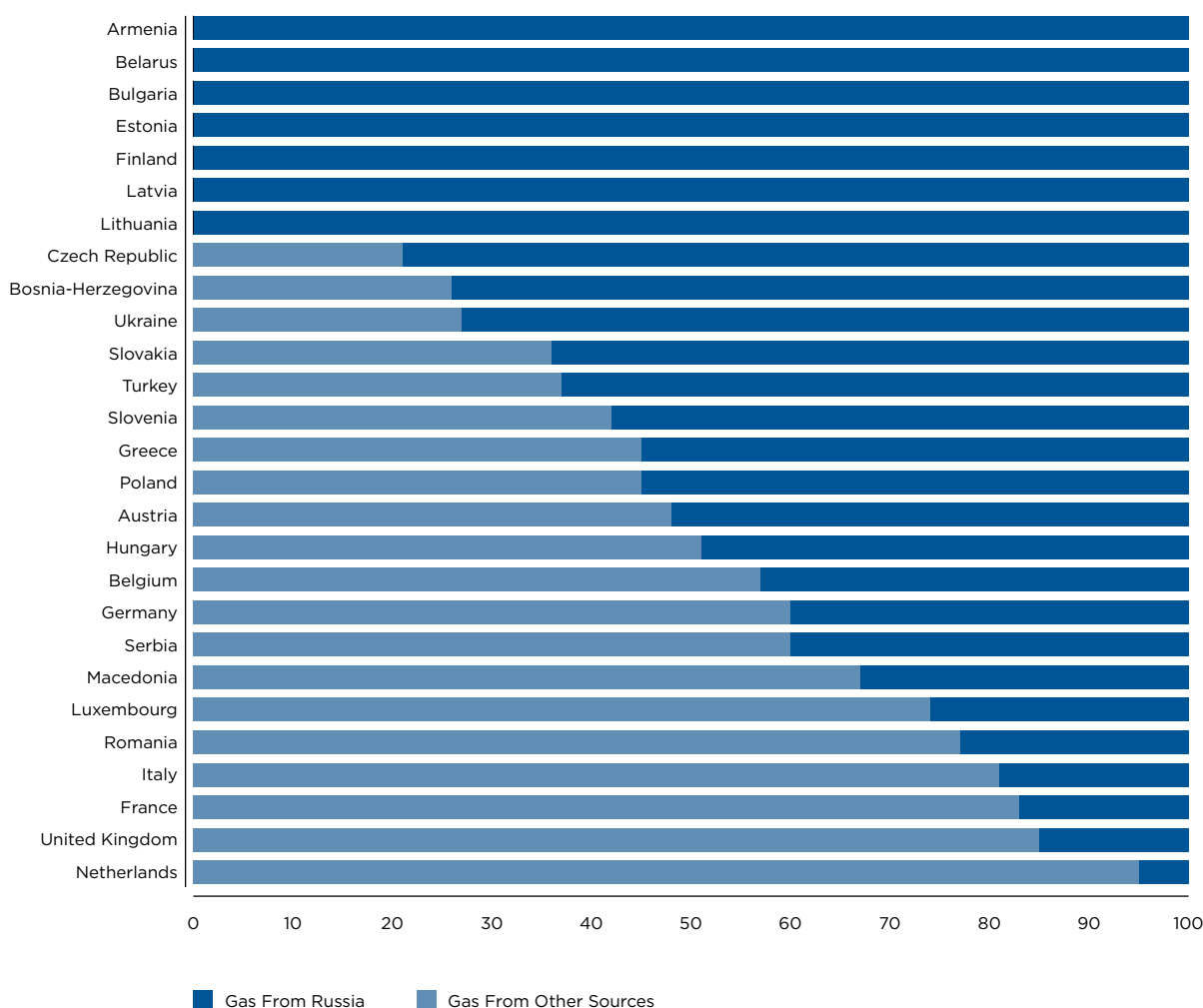
2 Leon Mangasarian, "Schroeder's Embrace With Putin Betrays Germany's Split on Russia," *Bloomberg Business*, April 29, 2014, <http://www.bloomberg.com/news/articles/2014-04-29/schroeder-s-embrace-with-putin-betrays-germany-s-split-on-russia>.

3 Heather A. Conley, "Russian Influence on Europe," (Washington, DC: Center for Strategic and International Studies, 2014), [http://csis.org/files/publication/141117\\_Conley.pdf](http://csis.org/files/publication/141117_Conley.pdf).

4 Ariel Cohen and Ivan Benovic, "The Hour of Truth: The Conflict in Ukraine—Implications for Europe's Energy Security and the Lessons for the US Army," US Army War College, December 2015 (forthcoming).

5 John Roberts, *The Impact of Turkish Stream on European Energy Security and the Southern Gas Corridor* (Washington, DC: Atlantic Council, July 9, 2015), <http://www.atlanticcouncil.org/publications/reports/the-impact-of-turkish-stream-on-european-energy-security-and-the-southern-gas-corridor>.

Figure 1. European Countries Depend on Russian Gas



Source: TAP Pipeline Open to Other Shareholders, Including Iran,” EurActiv, <http://www.euractiv.com/sections/energy/tap-pipeline-open-other-shareholders-including-iran-313641>.

Russian project to ship gas to Europe via Bulgaria, Serbia, Hungary, and Austria. While in 2015 prices slid down to the range of \$235-\$242 per 1,000 cubic meters, the geopolitical reality remained the same.<sup>6</sup>

As indicated by these examples, political loyalty is the most important variable affecting the price a country pays to Gazprom. This politicization contradicts market principles and creates disruptions and instability. The Kremlin’s geopolitical games harm European consumers—most of all, those who heavily rely on Russian gas. Russia has used its position as a supplier of energy, especially natural gas, as leverage to reach its political goals and enable corruption in Serbia, Bulgaria, Ukraine, Turkey, and elsewhere in the region. The Federal Bureau of Investigation is attempting to extradite Dmitry Firtash, the politically powerful Ukrainian oligarch who made billions importing Russian gas to Ukraine

for corrupt actions allegedly involving US-linked business activities.<sup>7</sup> However, Firtash’s home turf is Ukraine.

Serbian police have arrested members of the board of directors of the Gazprom-owned refinery there.<sup>8</sup> Russia also supports anti-Western opposition, and funnels funds to “environmental activists” who oppose hydraulic fracturing, and to extremist right-wing and left-wing politicians.<sup>9</sup>

Reducing Russian influence in the region has become an imperative for the United States, NATO, and the EU, as well

6 “Gazprom Export Official Said that Russia’s Energy Giant Gazprom is Estimating an Average Price for Gas Deliveries to Europe in 2015 Between \$235 and \$242 per 1,000 Cubic Meters,” *Sputnik*, August, 10, 2015, <http://sputniknews.com/europe/20150810/1025593257.html>.

7 “Catch Me If You Can,” *Economist*, May 3, 2015, <http://www.economist.com/news/europe/21650382-america-wants-prosecute-dmitry-firtash-austrian-court-refuses-extradite-him-catch-me-if>.

8 “Serbian Police Detain Head of Gazprom Neft Refinery,” *RAPSI News*, November, 14, 2013, [http://www.rapsinews.com/anticorruption\\_news/20131114/269650470.html](http://www.rapsinews.com/anticorruption_news/20131114/269650470.html).

9 Andrew Higgins, “Russian Money Suspected Behind Fracking Protests,” *New York Times*, November 30, 2014, [http://www.nytimes.com/2014/12/01/world/russian-money-suspected-behind-fracking-protests.html?\\_r=0](http://www.nytimes.com/2014/12/01/world/russian-money-suspected-behind-fracking-protests.html?_r=0), see also, Ariel Cohen, “Separatist Games with Fire,” *The Voice of America*, September 22, 2015, <http://blogs.voanews.com/russian/us-russia/2015/09/22/russia-for-separatism>.

as individual national governments. They can accomplish this strategic goal by improving coordination of their energy policies to make them more transparent and market driven, by enhancing energy efficiency, by increasing the non-Russian gas supply, and by sustaining energy production that relies on coal, nuclear, and renewable sources.

## GAS SUPPLY DIVERSIFICATION

The Black Sea region is pivotal in terms of addressing the challenge of gas supply diversification for Europe. The principal solution to this problem is geographic diversification of gas supply. Only a strongly competitive environment will force Gazprom to begin acting like a corporate entity and not a government agency.

Unsurprisingly, Russia would prefer to maintain its energy dominance, to the detriment of European interests in energy security and the diversification of gas sources. This becomes evident in Moscow's negative responses to the adoption by the European Union (EU) of the Third Energy Package, which creates a barrier against any one company having the ability to control the entire process of production, transportation, and sale of energy resources.<sup>10</sup> Essentially, the Package stops monopolies such as Gazprom from disrupting the markets by requiring one of three forms of unbundling:

- **Ownership Unbundling** where all integrated energy companies sell off their gas and electricity networks. In this case, no supply or production company is allowed to hold a majority share or interfere in the work of a transmission system operator.
- **Independent System Operator** where energy supply companies may still formally own gas or electricity transmission networks but must leave the entire operation, maintenance, and investment in the grid to an independent company.
- **Independent Transmission System Operator** where energy supply companies may still own and operate gas or electricity networks but must do so through a subsidiary. All important decisions must be taken independent of the parent company.<sup>11</sup>

## TURKISH STREAM: THE RISE AND FALL?

Moscow initially rejected the Third Energy Package's provisions instead of accommodating its principal customers in the EU. The war in Ukraine, along with Western sanctions, made the South Stream project politically untenable.

10 Binoy Kampmark, "Cancelling the South Stream Project: The Woes of Energy Insecurity," *Global Research*, December 13, 2014, <http://www.globalresearch.ca/cancelling-the-south-stream-project-the-woes-of-energy-insecurity/5419705>.

11 European Commission, "Market Legislation—Energy—European Commission," <https://ec.europa.eu/energy/en/topics/markets-and-consumers/market-legislation>.

Russian President Vladimir Putin cancelled the South Stream in December 2014.<sup>12</sup> Putin replaced South Stream with Turkish Stream, initially envisaging four pipelines capable of delivering gas across the Black Sea straight to Turkey. According to a study published by the Oxford Institute for Energy Studies, "Of the 63 billion cubic meters per year (bcm/y) of capacity, 14 bcm/y would replace the volume currently delivered to Turkey via Ukraine and the trans-Balkan pipeline, while the rest (approximately 50 bcm/y) would be delivered to the Turkish-Greek border, where Gazprom would set up a natural gas hub for Southern and Central European customers."<sup>13</sup>

This shift demonstrates Russia's strategic tenacity and tactical flexibility. The Turkish Stream project, if implemented, is more likely to meet the requirements of the Third Energy Package, while eluding the overall intent of the regulations. While it is unlikely that Turkey will allow Gazprom to have full ownership of the pipeline on its territory, or that Russia would simultaneously sell gas and own the local distribution companies in the EU, the Russian project essentially side-steps the core issue of diversifying the gas supply to Europe.

Under the initial Russian plan, the original volume of gas that was to be supplied via the South Stream—63 bcm/y—would still be supplied by Turkish Stream. Furthermore, 47 bcm/y of this amount would enter a pipeline ending at the Greek-Turkish border, so that Russia could elude EU jurisdiction.<sup>14</sup>

Gazprom later suggested that it would initially build only two pipelines, cutting the volume of gas to be supplied to 31.5 bcm/y. If the Trans-Anatolian gas pipeline (TANAP) meets its own projections, it will not match this amount until 2026. Initially, TANAP intends to deliver 16 bcm/y.<sup>15</sup>

The bottom line is that the purpose of Turkish Stream is to defend Russia's share of the European gas market by supplying cheaply piped gas. The Turkish Stream project could have significant geopolitical consequences, impacting the regional balance of power:

- **Expansion** of Russian military power in the Black Sea and the Caucasus. Russia is deploying more numerous and more powerful military assets, including long-range bombers and surface-to-surface and anti-aircraft missile

12 Darya Korsunskaya, "Putin Drops South Stream Gas Pipeline to EU, Courts Turkey," *Reuters*, December 1, 2014, <http://www.reuters.com/article/2014/12/02/us-russia-gas-gazprom-pipeline-idUSKCN0J-F30A20141202>.

13 Jonathan Stern, Simon Pirani, and Katya Efimava, "Does the Cancellation of South Stream Signal a Fundamental Reorientation of Russian Gas Export Policy," Oxford Institute for Energy Studies, January 2015, <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/01/Does-cancellation-of-South-Stream-signal-a-fundamental-reorientation-of-Russian-gas-export-policy-GPC-5.pdf>.

14 Stephen Blank, "The Militarization of the Black Sea," Center for European Policy Analysis, July 20, 2015, <http://www.cepa.org/content/militarization-black-sea>.

15 Hydrocarbons-Technology.com, "Trans Anatolian Natural Gas Pipeline Project (TANAP), Turkey," <http://www.hydrocarbons-technology.com/projects/trans-anatolian-natural-gas-pipeline-project-tanap>.

## TURKISH POLICYMAKERS ARE WORRIED THAT THEY FACE GROWING RUSSIAN MILITARY POWER IN THE CRIMEA AND IN SYRIA, WHICH PUTS TURKEY IN A VISE.

systems, to Crimea, where such assets had not been deployed prior to the annexation.<sup>16</sup> Turkish Stream would provide excellent political cover—Russia's protection of its oil and gas projects in the Black Sea will feature prominently in any rationale for these deployments.

- **Increase** in military cooperation between Russia and Turkey. For decades, NATO member Turkey could block the Black Sea Fleet from entering the Mediterranean because Ankara controls the Turkish Straits (the Bosphorus and the Dardanelles). Because one of the goals of the Russian grand strategy is to increase naval power projection in the Mediterranean, the Atlantic, and the Indian Ocean, a close strategic relationship with Turkey is a priority for the Kremlin.
- **Enlargement** of the Eurasian Economic Union (EEU). Turkey has been a candidate for European Union membership for quite a long time, but it is increasingly clear that other European nations do not want the country to join. The Kremlin has created the Eurasian Economic Union as a counterweight to the EU. In case of an irreparable break with NATO and the US and a change in a strategic geopolitical orientation away from the West, Russia would like Turkey to join its new organization, and Turkish Prime Minister Recep Tayyip Erdoğan has expressed a desire to do so in the past.<sup>17</sup> The gas deal could serve as leverage to achieve this. Having Turkey's relatively strong economy within the ranks of the Eurasian Economic Union would allow Russia to shift the balance of economic power in the region, and in the world.<sup>18</sup> However, with deteriorating relations between Moscow and Ankara over Syria, this development is not in the cards in the near future.

Overall, as it was configured, the Turkish Stream project will be beneficial only to Russia and one other country—

16 "Black Sea Fleet: A Return to Russia's Great Power Pretensions," *Interpreter*, September 25, 2014, <http://www.interpretermag.com/black-sea-fleet-a-return-to-russias-great-power-pretensions>.

17 Ümit Nazmi Hazır, "Is Eurasian Economic Union Membership Possible for Turkey?", *Turkish Weekly*, April 6, 2015, <http://www.turkishweekly.net/2015/04/06/news/is-eurasian-economic-union-membership-possible-for-turkey/>.

18 Ariel Cohen, "Russia's Eurasian Union Could Endanger the Neighborhood and US Interests," Heritage Foundation, June 14, 2013, <http://www.heritage.org/research/reports/2013/06/russias-eurasian-union-could-endanger-the-neighborhood-and-us-interests>.

Turkey. The Balkan states, which were supposed to benefit from the South Stream, would likely become even more dependent on Russia as a problematic source of foreign gas supply. The same will likely prove true for Europe as a whole. Instead, diversification, which involves the Southern Gas Corridor, appears to be a preferable alternative for the energy-importing countries and companies in the region.

However, on September 15, 2015, Alexander Medvedev, Gazprom's veteran Deputy Chairman, announced that there are significant delays in building Turkish Stream and that the pipeline will not be completed by the end of 2016, as planned. He blamed "political turmoil" in Turkey.<sup>19</sup> In reality, Ankara reacted with growing anger to Russian intervention in Syria, especially violations of Turkish airspace by Russian warplanes.<sup>20</sup> For years, Erdoğan has sought to oust Syrian President Bashar al-Assad, fought radical Kurdish groups such as Kurdistan Workers' Party (PKK), and supported Sunni Arab opposition. However, Putin's intervention makes such actions much more difficult. Moreover, Turkish policymakers are worried that they face growing Russian military power in the Crimea and in Syria, which puts Turkey in a vise.<sup>21</sup> It appears that the friction between Ankara and Moscow, caused by the Syrian conflict, influenced the decision to delay the project as Russian incursions into Turkish airspace and the bickering over Moscow's Syrian operation appeared to have overwhelmed the strong business relationship.

## WHY TANAP/TAP IS A BETTER ALTERNATIVE THAN TURKISH STREAM

The TANAP/TAP project was announced in November 2011, at the Third Black Sea Energy and Economic Forum in Istanbul, as an alternative to the failed Nabucco pipeline project.<sup>22</sup> TANAP is a new 48-56-inch standalone pipeline under construction across Turkey, and is intended to carry Azeri natural gas from the Shah Deniz II field. The estimated reserves of Shah Deniz II alone are 991 bcm. TANAP's projected capacity is 30 bcm/y, and the field itself has reserves for at least a 30-year supply. The Shah Deniz II consortium consists of the following companies:

The number of shareholders in the TANAP pipeline consortium is significantly lower, and consists of only three mem-

19 Daniel J. Graeber, "Russia's Turkish Stream Pipeline on Hold," *United Press International*, September 15, 2015, [http://www.upi.com/Business\\_News/Energy-Industry/2015/09/15/Russias-Turkish-Stream-pipeline-on-hold/9311442309369](http://www.upi.com/Business_News/Energy-Industry/2015/09/15/Russias-Turkish-Stream-pipeline-on-hold/9311442309369).

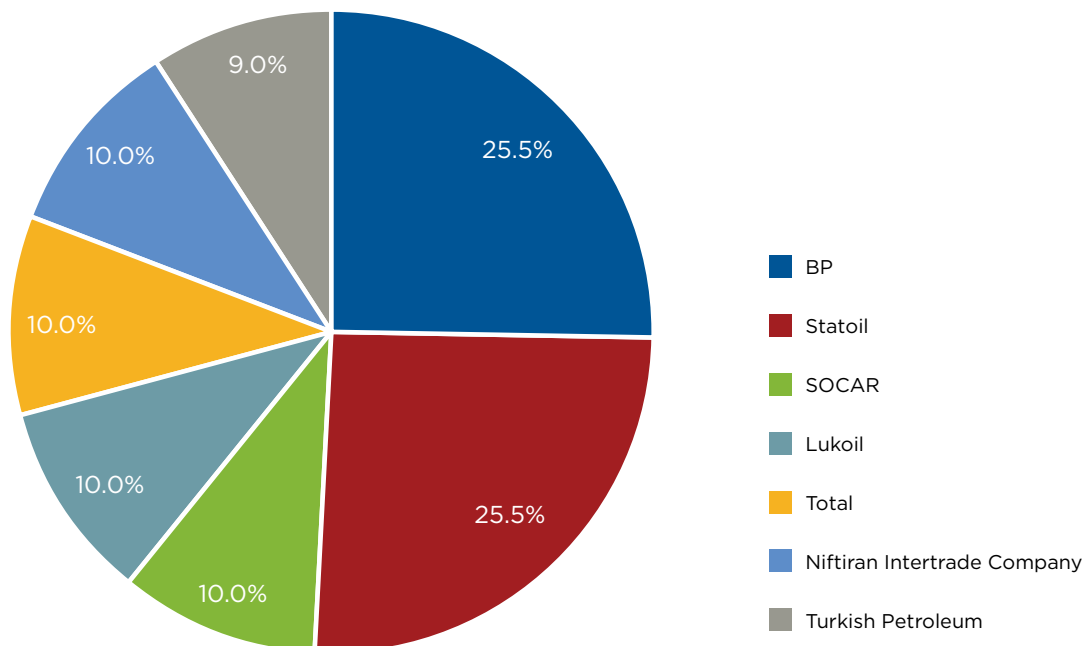
20 Suzan Fraser and Vladimir Isachenkov, "NATO Denounces Russia for Violating Turkish Airspace," *ABC News*, October 5, 2015, <http://abcnews.go.com/International/wireStory/turkey-russian-warplane-violated-air-space-34250018>.

21 Tim Arango, "Russia Military's Actions in Syria Cause Rift With Turkey," *New York Times*, October 6, 2015, <http://www.nytimes.com/2015/10/07/world/middleeast/russia-turkey-tensions-rise-over-syria.html>.

22 Ferruh Demirmen, "BP-SOCAR Duo Deliver 'Coup De Grace' to Nabucco," *News.Az*, December 19, 2011, <http://www.news.az/articles/economy/51212>.



Figure 2. Shah Deniz II consortium



Source: BP, "Frequently Asked Questions," [http://www.bp.com/en\\_az/caspian/operationsprojects/Shahdeniz/FAQ.html](http://www.bp.com/en_az/caspian/operationsprojects/Shahdeniz/FAQ.html); Christopher E Smith, "Shah Deniz II, South Caucasus Pipeline Contracts Awarded," *Oil & Gas Journal*, March 20, 2014, <http://www.ogj.com/articles/2014/03/shah-deniz-ii-south-caucasus-pipeline-contracts-awarded.html>.

bers—State Oil Company of Azerbaijan Republic (SOCAR) with a 58-percent share, Turkey's pipeline operator BOTAS with 30 percent, and BP, which acquired 12 percent of the project on March 13, 2015.<sup>23</sup> These projects comply with the requirements, as well as the intent, of the EU's Third Energy Package. This fact would give them a serious advantage over the Turkish Stream, if it were realistic today.

The Trans-Adriatic Pipeline is an important component of the Southern Gas Corridor initiative, as it would link Asia and Europe. The TAP would bring Azeri gas from Turkey, via Greece and Albania, across the Adriatic Sea to Italy.

However, it was announced in April 2015 that the project will be open to new shareholders, including Iran.<sup>24</sup> TAP's initial capacity is 10 bcm/y. With compressors added, the throughput could increase to more than 20 bcm/y. The "physical reverse flow" feature will be also added to the project, to allow for gas from Italy to be pumped across the Adriatic to Southeast Europe in case of energy supply interruption.<sup>25</sup> However, it is important to ensure that TAP fulfills its energy-security role by dealing exclusively with non-Russian gas, so that Gazprom does not utilize this open-access policy.

<sup>23</sup> "BP Acquires 12 Percent Stake in TANAP Gas Pipeline Project," Anadolu Agency, March 13, 2015, <http://www.aa.com.tr/en/s/477976--bp-acquires-12-percent-stake-in-tanap-gas-pipeline-project>.

<sup>24</sup> "TAP Pipeline Open to Other Shareholders, Including Iran," *EurActiv*, April 9, 2015, <http://www.euractiv.com/sections/energy/tap-pipeline-open-other-shareholders-including-iran-313641>.

<sup>25</sup> Trans-Adriatic Pipeline, "TAP at a Glance," <http://www.tap-ag.com/the-pipeline>.

The EU Directorate-General Energy and Directorate-General Competition must fulfill their duties in this respect.

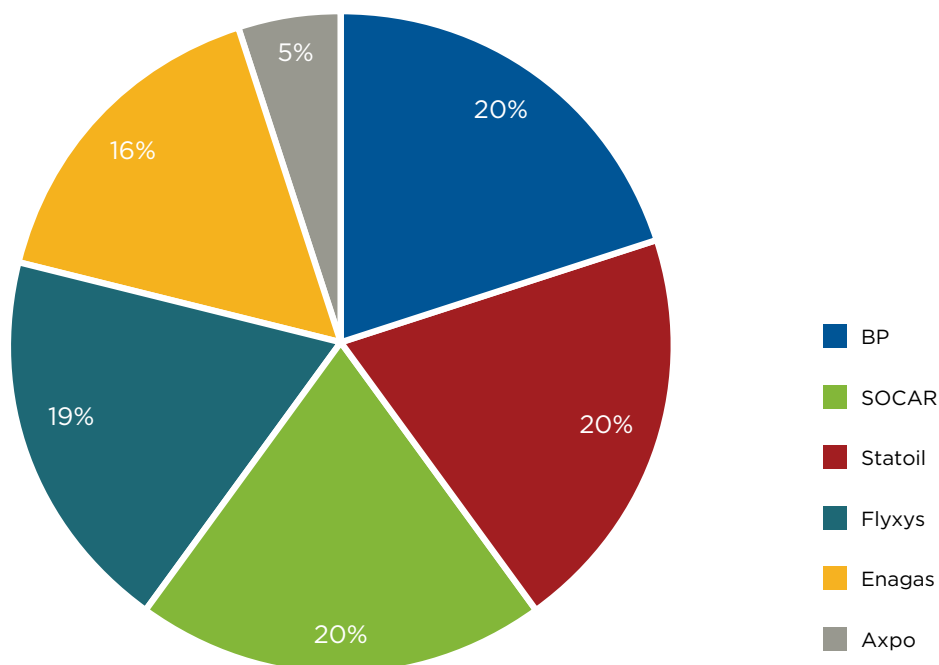
## ALTERNATIVES TO RUSSIAN GAS: REGIONAL PIPELINES AND INTERCONNECTORS

**Greece-Bulgaria Interconnector.** Although only three countries will be directly involved in the TAP project, the number of countries that could benefit from its implementation is likely to rise in the future. For instance, in early 2014, Turkey and Bulgaria agreed to build a 114-kilometer pipeline connecting the two countries' natural gas distribution networks, which would allow for the supply of additional volumes from Shah Deniz to Europe. Such a linkage would improve western Black Sea littoral energy security, benefitting Bulgaria.

This interconnector initiative envisages building a Greece-Bulgaria interconnector (IGB), which would receive natural gas from TAP. The expectation is that Azerbaijan would finance the project. With the cancellation of South Stream, Bulgarian officials expressed their hopes for the resurrection of Nabucco West. In response, Azeri President Ilham Aliyev said that Bulgaria could instead build an interconnector with Greece in order to meet its energy needs.<sup>26</sup>

<sup>26</sup> "Bulgaria, Romania Launch Joint Tender to Complete Gas Link," *Energy & Oil*, Reuters, March 20, 2015, <http://af.reuters.com/article/energyOilNews/idAFL6N0WM2IV20150320>.

Figure 3. Major TAP shareholders



Source: "TAP Pipeline Open to Other Shareholders, Including Iran," EurActiv, <http://www.euractiv.com/sections/energy/tap-pipeline-open-other-shareholders-including-iran-313641>.

Bulgaria, Romania, and Hungary, particularly the latter two, are the most exposed EU countries in terms of gas supply security. If TAP and an additional interconnector are not implemented, they would remain almost completely dependent on Gazprom as their sole gas supplier. Construction of an Ionian-Adriatic Pipeline (IAP) and Western Balkan Ring (WBR) that connect to TANAP and TAP would ease some of the pressure. Turkish officials recently announced that construction of an additional interconnector to Hungary through Macedonia and Serbia is being discussed.<sup>27</sup> If realized, this plan would affect Gazprom's hegemony in Southern Europe, including the Balkans, and improve stability within the region. Map 2 (p. 9) shows the full scale of the TAP initiative, including related interconnector projects.

Construction of the Interconnector Greece-Bulgaria (IGB) Pipeline could start in March 2016, according to reports from Bulgaria's Energy Ministry.<sup>28</sup> This initiative would eliminate the need for revival of the Nabucco West project.

**Nabucco West.** The Nabucco West project has been frozen, but not entirely abandoned. The need to supply Southern and Central Europe with gas remains. However, the revival

of this project would require a significant increase in Caspian (and possibly Iraqi and Eastern Mediterranean) gas export capacities. There is also the attractive option of adding Turkmenistan to the supply chain. In May 2015, Turkmen officials told Maroš Šefčovič, EU Vice President for Energy Union, that they have the capability to provide the European market with the needed volumes of gas—either via a marine interconnector to Azerbaijan, or via Iran.<sup>29</sup> A revival of the Nabucco West project may become possible, provided there are sufficient amounts of natural gas available for exports from the South Caucasus and the Caspian, and sufficient demand for gas from European customers. A major international energy company is likely to boost the project. Map 2 (p. 9) shows the route of Nabucco West in comparison with the other gas pipelines.

**Eastring** is the most intriguing pipeline project in the region. It addresses the vital needs of the countries concerned—and is reversible. The proposed pipeline would connect Slovakia with Romania via Hungary. One version of the pipeline would be 832 kilometers long, while another would be 1,274 kilometers long and reach Bulgaria.<sup>30</sup> The project relies heavily on the existing Eustream pipeline.

27 "BP Becomes a Partner in the Trans-Anatolian Gas Pipeline," *Daily Sabah*, March 14, 2015, <http://www.dailysabah.com/energy/2015/03/14/bp-becomes-a-partner-in-the-transanatolian-gas-pipeline>.

28 "Construction of Gas Interconnector Greece-Bulgaria May Start in March 2016," *Novinite*, March 30, 2015, <http://www.novinite.com/articles/167576/Construction+of+Gas+Interconnector+Greece-Bulgaria+May+Start+in+March+2016>.

29 Bruce Panier, "Still One Big Obstacle To Turkmen Gas To Europe," *Radio Liberty/Radio Free Europe*, May 5, 2015, <http://www.rferl.org/content/turkmenistan-natural-gas-europe-trans-caspian-pipeline/26996003.html>.

30 "Slovakia, Hungary, Romania, and Bulgaria Embark on Gas Pipeline Project," *EurActiv*, May 22, 2015, <http://www.euractiv.com/sections/energy/slovakia-hungary-romania-and-bulgaria-embark-gas-pipeline-project-314793>.

Map. 1 Turkish Stream and the Southern Gas Corridor



Source: Atlantic Council.

Eastring is planned as a bidirectional pipeline, with a 20 bcm/y throughput at the first stage and 40 bcm/y at the second stage. Azerbaijan, Cyprus, Iraq, Israel, Russia, and Turkmenistan would be able to supply gas. The target date for beginning construction of the first stage is 2018.<sup>31</sup> However, an LNG terminal closer to the region, such as Krk Island in Croatia, may save gas distributors transportation costs and tariffs.

**The North-South Corridor** is a proposed project that would include a system of integrated power lines and transportation routes, as well as oil and gas pipelines running from the Baltic Sea to the Adriatic and Black Seas. This project would definitely enhance Europe's energy security by strengthening the energy bonds between nations. It would also enforce the transition away from the Soviet-era energy network still in existence in formerly socialist Eastern European countries. Participation in this legacy system—as is the case with the Baltic states—creates serious problems. It complicates sustainable development as a member of united Europe and makes countries more vulnerable to Russian influence. Transcending this legacy is essential for any country from the former communist bloc.

According to the European Commission, “overall investment needs for transport, energy, and telecom infrastructure networks of importance to the EU amount to €1 tril-

lion for the period up to 2020.”<sup>32</sup> Given the importance of a strategic project such as the North-South Corridor, the EU members must resolve their financial and administrative challenges, and arrive at a consensus among the members concerning this vital energy security package, which would provide the much-needed framework for further European energy projects.

**Adria LNG** is a proposed floating LNG terminal on the island of Krk, Croatia. This project would form the southern point of the North-South Corridor initiative. Based on reports by the Croatian government, construction of the Krk Island LNG terminal in the Adriatic Sea could begin in mid-2016.<sup>33</sup> The expected capacity of the floating terminal is about 4 bcm/y.<sup>34</sup> Given the fact that Croatia's domestic consumption has remained stagnant at 3 bcm/y during the last ten years,<sup>35</sup> it is reasonable to assume that Croatia will become a net exporter of natural gas if the project is carried out.

**Odesa LNG.** Ukrainian Prime Minister Arseniy Yatsenyuk has announced that the national oil-and-gas company,

31 “Former Czech Prime Minister Promotes Eastring Gas Pipeline,” *EurActiv*, May 7, 2015, <http://www.euractiv.com/sections/energy/former-czech-pm-promotes-eastring-gas-pipeline-314394>.

32 European Commission, “Long-Term Financing of the European Economy,” March 23, 2013, [http://eur-lex.europa.eu/resource.html?uri=cellar:9df9914f-6c89-48da-9c53-d9d6be7099fb.0009.03/DOC\\_1&format=PDF](http://eur-lex.europa.eu/resource.html?uri=cellar:9df9914f-6c89-48da-9c53-d9d6be7099fb.0009.03/DOC_1&format=PDF).

33 Kruno Kartus, “Croatia Sees Krk LNG Terminal Construction Start-Up by Mid-2016,” *Natural Gas Europe*, May 25, 2015, <http://www.naturalgas-europe.com/croatia-krk-lng-terminal-construction-23837>.

34 Aiswarya Lakshmi, “Croatia Mulls LNG Facility,” *Marine Link*, July 12, 2015, <http://www.marinelink.com/news/facility-croatia-mulls394477.aspx>.

35 “Croatia—Natural Gas—Consumption—Historical Data Graphs per Year,” *IndexMundi*, <http://www.indexmundi.com/g/g.aspx?c=hr&v=137>.

**Map. 2 Existing, Planned or Proposed Long-distance Pipelines in Southeastern Europe**

Source: Atlantic Council.

Naftogaz Ukrainy, signed a memorandum of understanding with the Texas-based Frontera Resources Corporation to begin the construction of an LNG project in the port city of Odesa.<sup>36</sup> This project is designed to bring gas from Frontera's upstream gas holdings in Georgia to Ukraine. The LNG purification and liquefaction facility ("train") is designed to be built and expanded in incremental modules, which are each anticipated to handle approximately 0.5 bcm/y, with ultimate targeted capacity of 10 bcm/y. Liquefaction facilities will be situated on Georgia's Black Sea coast, with regasification facilities situated in Odesa.

This project will be supplied from Frontera's gas fields in Georgia. However, in order to expand deliveries of

LNG to Odesa from the world market, Ukraine would have to resolve a critical issue—the refusal of the Turkish government to allow LNG tankers through the Bosphorus Straits, citing security concerns for the city of Istanbul. Some in Kyiv also see Ankara's LNG transportation ban as a sign of improved Turkish-Russian relations, connected with plans to build the Turkish Stream pipeline.<sup>37</sup> By eliminating an opportunity for Ukraine to satisfy its energy needs from sources other than Gazprom, Ankara may be placating Moscow, while simultaneously obtaining more favorable conditions for the Turkish Stream deal.

36 "Frontera, Naftogaz Sign 2-year MoU for Upstream, LNG," Natural Gas Europe, July 15, 2015, <http://www.naturalgaseurope.com/frontera-naftogaz-sign-2-year-mou-for-upstream-lng-24644>.

37 Isis Almeida, "Shipping Chokepoint Strangles Ukraine Hopes for US LNG," *Bloomberg*, December 4, 2014, <http://www.bloomberg.com/news/articles/2014-12-04/shipping-chokepoint-strangles-ukraine-hopes-for-u-s-lng>.



## ALTERNATIVES TO RUSSIAN GAS: DEVELOPING DOMESTIC RESOURCES IN THE BLACK SEA BASIN

Several countries that currently rely on Russian supplies, or serve as major transit corridors for Russian and Caspian gas, actually have ample hydrocarbon reserves. They can become independent—or nearly independent—as far as their natural gas supply is concerned.

For example, Georgia has emerged as a potentially important hydrocarbon source for Europe. On October 8, 2015, Frontera Resources announced its discovery of massive resources of gas in eastern Georgia, where it is already producing oil and gas. The company estimates natural gas resources to be 3.8 trillion cubic meters (tcm) of gas in place in its South Kakheti Gas Complex.<sup>38</sup> Frontera's oil holdings in the country have been independently estimated to exceed one billion barrels in place, and a new estimate of recoverable and economically viable gas reserves will be forthcoming.

THE UNITED STATES AND EU SHOULD CONVINCE THE GOVERNMENT OF UKRAINE TO FIGHT CORRUPTION, AND TO KEEP TAXATION LEVELS LOW ENOUGH TO ATTRACT DOMESTIC AND FOREIGN INVESTMENT INTO THE UKRAINIAN HYDROCARBON SECTOR.

Provided the size of this large-scale discovery is confirmed independently, and geopolitical challenges are handled successfully, this means that Georgia, a low-middle-income country, could become a net exporter of gas rather than a net importer. The South Kakheti find can supply Turkey, Romania, Ukraine, and European markets farther west. As these gas resources are brought to market, Georgia could export gas via a small-scale LNG terminal located on the Georgian Black Sea coast, or via the Main Export Pipeline to Turkey and TANAP.

<sup>38</sup> "Frontera Resources Corporation Marks Historic One Year Anniversary of Gas Production Operations in Georgia," *Business Wire*, May 5, 2015, <http://www.businesswire.com/news/home/20150505005601/en/Frontera-Resources-Corporation-Marks-Historic-Year-Anniversary#.Vh8Xvi-u22M8>. See also "Frontera Resources Upgrades Gas Potential in Georgia Operations," *Business Wire*, October 8, 2015, [http://www.businesswire.com/news/home/20151008005538/en/Frontera-Resources-Upgrades-Gas-Potential-Georgia-Operations#.Vhr\\_UvlVhBc](http://www.businesswire.com/news/home/20151008005538/en/Frontera-Resources-Upgrades-Gas-Potential-Georgia-Operations#.Vhr_UvlVhBc).

Another potential method of gas export across the Black Sea is compressed natural gas (CNG)—a technology that is profitable for gas transportation for up to 2,500 kilometers. It appears that the capital expenditure involved for such a project may be lower than that for LNG, and CNG does not require expensive and energy-consuming refrigeration. Shipping CNG might be cheaper than shipping LNG. It has a lower cost of compression and storage, as it does not require regasification facilities, an expensive cooling process, or cryogenic tanks.<sup>39</sup> However, CNG requires a much larger storage volume than the same amount of LNG by mass, and many in this conservative industry distrust new technology.

Today, Georgia provides transit for approximately two million barrels of oil equivalent per day into Turkey and Europe. In the future, the windfall profits for Georgia from energy exports could transform this low-middle-income country into a high-middle income state, and provide the financial base for both the industrial development and an improved social safety net. Moreover, with Georgia's role as an increasingly important east/west transit hub for oil and gas, becoming a significant producer and exporter would give the country more regional relevance. Given this, Georgia now has the opportunity to increase its importance to NATO and European energy security, with its strategic location bordering the organization's easternmost member, Turkey, as well as Russia.

What Georgia needs today is supportive leadership, especially in the Energy Ministry, that enforces government policies to open the country for exploration and production, protect property rights, and facilitate domestic distribution and exports of locally produced gas. The country also needs transparency, good governance, and the rule of law—without these, foreign investment will remain severely constrained.

Its strategic location and reserves, together with considerable hydropower potential and the proximity of the energy-hungry Turkish market, could make Georgia a promising energy supplier to the whole Black Sea area and beyond.

Ukrainian gas reserves—including conventional on- and offshore, as well as shale—are so significant that the country could become a net exporter of gas to Europe over time. However, with the annexation of the Crimea, Russia has expanded its exclusive economic zone (EEZ) in the Black Sea, seizing Ukrainian energy assets worth tens of billions of dollars. In the early days of Russian occupation, Georhii Rudko, Chairman of the Ukrainian State Commission for Natural Resources, gave a presentation on the future of Ukraine's oil and gas resources. According to him, "The Crimean offshore areas represent a third of the undiscovered natural gas resources of Ukraine and a fifth of the undiscovered oil resources . . . including: oil and condensate—1,148 million tons (mt) and gas—3,831 bcm. Only 5 percent of this potential has been developed. The deep

<sup>39</sup> "Compressed Natural Gas (CNG)," PetroWiki, [http://petrowiki.org/Compressed\\_natural\\_gas\\_\(CNG\)](http://petrowiki.org/Compressed_natural_gas_(CNG)).

Black Sea area has potential recoverable resources of more than 1,000 mt of coal equivalent (54 percent of the total Black Sea resources).<sup>40</sup>

US-European Black Sea energy policy should include formulating an adequate response to the Russian resource grab and pursuing available remedies through international legal action and sanctions on companies that attempt to recover these resources as long as they remain captured assets. Additionally, the United States and EU should convince the government of Ukraine to fight corruption, and to keep taxation levels low enough to attract domestic and foreign investment into the Ukrainian hydrocarbon sector.

Romania has also proven to be a favorable destination for on- and offshore exploration in the Black Sea region. ExxonMobil is the primary oil company drilling offshore in Pelikan-1 and Domino, which appear to be the largest Black Sea hydrocarbon discoveries. This is definitely a good sign for Bucharest, and for the whole region. The United States, the EU, and the countries in the region should support indigenous energy development, as it boosts the sustainability and security of all the actors involved.

On the other hand, the development of shale gas, which is highly successful in the United States, has so far proven a disappointment in the western Black Sea region. Romania and Ukraine are the only countries in the western Black Sea that permit development of shale gas deposits. However, initial exploration attempted by major Western companies, such as Chevron, has also revealed that the deposits of shale gas in Romania are not economically efficient, due to their relatively small size.<sup>41</sup>

In December 2014, Chevron announced it had stopped exploration of shale gas reserves in western Ukraine. According to *Financial Times*, “The company lost interest in the project after findings in nearby Poland and Lithuania, which have similar geologies, showed that available reserves were smaller than anticipated.”<sup>42</sup> Later, in June 2015, Royal Dutch Shell notified Ukrainian officials that it would pull out of a shale gas exploration project in the east of the country, due to the security situation. However, these setbacks should not discourage small and medium-sized companies, which tend to be more risk tolerant, from pursuing exploration and production in the area.

**The Azerbaijan–Georgia–Romania Interconnector (AGRI)**, which has been under consideration by Azerbaijan and Romania since 2010, envisages transportation of natural gas via a pipeline from Azerbaijan to Georgia, and

construction of an LNG terminal of 5-8 bcm capacity in the Georgian coastal town of Kulevi, near the port of Poti.<sup>43</sup> This way, Azeri, and in the future, Turkmen gas could find an alternative route to the European markets through AGRI. If the project is profitable, and if the Russian threat to Georgia abates, natural gas will be transported by LNG tankers to the regasification terminals in the Romanian port of Constanta, and to Odesa in Ukraine. From there, Azeri gas would find its way to European consumers. This route could also serve as a CNG shipping line.

## ALTERNATIVES TO RUSSIAN GAS—BEYOND THE BLACK SEA: NORTHERN IRAQ/KURDISTAN

The Black Sea basin is a transit area for energy flows to Central and Eastern Europe—not only from east to west, but also from south to north. The Turkey–Iraq Gas Pipeline would allow Turkey and Europe access to Iraq’s natural gas reserves. While Ankara and the Kurdish Regional Government (KRG) signed a memorandum of understanding a number of years ago, feasibility studies for the project have not yet started.

As of August 2015, Kurdistan has not exported any natural gas. Local authorities prioritized oil-focused projects due to higher rates of return on investment. In addition, significant legal constraints exist in the field of energy resource extraction, due to conflicts between the Iraqi central government in Baghdad and Islamic State of Iraq and al-Sham (ISIS) operations in Syria and Iraq. Recent military operations conducted by Turkey against the PKK Kurdish militia have further aggravated the situation, heightening political risk. Nevertheless, Turkey and the Kurds have a common interest in developing and exporting gas, gaining closer economic ties and a new revenue stream.

Iraq possesses impressive reserves of some 3.17 trillion cubic meters of natural gas, a great deal of it in the south of the country. However, today Iraq flares 58 percent of its natural gas production due to the lack of pipeline infrastructure.<sup>44</sup> A pipeline system sending gas from Iraqi Kurdistan to Turkey, and farther afield to Europe, would be a win-win, benefitting the KRG, the Turkish government, and European consumers. Kurdistan could become an additional source of gas for Turkey and the Southern Gas Corridor. However, the Eastern Mediterranean, a region to the southwest, will provide stiff competition.

40 John Helmer, “Russia’s Attempted Crimea Annexation Would Include Huge Offshore Gas Reserves,” *Business Insider*, March 13, 2014, <http://www.businessinsider.com/crimea-annexation-would-include-offshore-gas-reserves-2014-3>.

41 “European Shale Dream Dying Before It Started,” *CNBC*, February 23, 2015, <http://www.cnbc.com/2015/02/23/chevron-withdraws-from-romania-shale-gas-projects.html>.

42 Roman Olearchyk, “Chevron Pulls out of Shale Gas Project in Ukraine,” *Financial Times*, December 15, 2014, <http://www.ft.com/cms/s/0/76b41d9c-847e-11e4-ba4f-00144feabdc0.html#axzz3kSSA07IS>.

43 Anca Elena Mihalache, “Making sense of AGRI’s future,” *Natural Gas Europe*, July 27, 2015, <http://www.naturalgaseurope.com/making-sense-of-agri-future-24782>.

44 US Energy Information Administration (EIA), “EIA Independent Statistics and Analysis,” <http://www.eia.gov/countries/cab.cfm?fips=iz>.

## ALTERNATIVES TO RUSSIAN GAS—EASTERN MEDITERRANEAN: EGYPT, ISRAEL, AND CYPRUS

The Eastern Mediterranean is a strategic region capable of significantly reducing Europe's dependence on Russian gas. Located less than one thousand miles from the Black Sea, it can become an important supplier to the Balkans, South-Central Europe, and beyond, including the heart of Europe. It would also make Cyprus an important energy hub, for the Eastern Mediterranean and all of Southern Europe.

The recent discovery by Eni of the supergiant gas field at the Zohr Prospect, in the waters off Egypt (1,450 meters deep) shines a spotlight on the Eastern Mediterranean. Overnight, Egypt emerged as potentially the leading LNG supplier in the region. Zohr, the largest natural gas discovery ever made in Egypt, or in the Mediterranean Sea, holds an estimated 900 bcm of lean gas, in an area of about one hundred square kilometers. It could change the future energy balance in both the Eastern Mediterranean and Europe.<sup>45</sup> Eni may sell the field output to Egypt and liquefy it in the Segas plant at Damietta and the Egyptian LNG facility at Idku, providing a boost to Egypt's economy. Located fifty kilometers east of Alexandria is one of the world's largest producers, Egyptian LNG. The company has the capacity to expand from the current two trains to six, processing potentially different sources of feed gas with great flexibility.

The two currently operational trains have a combined capacity of 7.3 million tons per year. Egyptian LNG is a consortium that includes both domestic shareholders, such as Egyptian General Petroleum Corporation (EGPC) and Egyptian Natural Gas Holding Company (EGAS), and foreign shareholders, such as BG Group, Petrolim Nasional Berhad (PETRONAS), and Engie (previously called GDF Suez).

The development of the natural gas fields in Cyprus, Egypt, and Israel—along with the creation of an LNG terminal and/or pipeline network between the producing, transit, and consuming countries—would bring long-term benefits to European consumers. A joint offshore gas development by Noble Energy in the exclusive economic zone of Israel and Cyprus might require one of the world's largest pipeline systems.

With the development of the Aphrodite and Leviathan natural gas fields offshore Cyprus and Israel, the two countries could participate in major regional energy projects. Aphrodite is a relatively small field in the Eastern Mediterranean region, with estimated reserves of 200 bcm. Leviathan and Tamar, the Israeli offshore fields, are bigger. Tamar holds approximately 303 bcm. According to expert analyses, Leviathan has more than twice that amount, with 620 bcm.

<sup>45</sup> Eni, "Eni Discovers a Supergiant Gas Field in the Egyptian Offshore, the Largest Ever Found in the Mediterranean Sea," August 30, 2015, [http://www.eni.com/en\\_IT/media/press-releases/2015/08/Eni\\_discovers\\_supergiant\\_gas\\_field\\_in\\_Egyptian\\_offshore\\_the\\_largest\\_ever\\_found\\_in\\_Mediterranean\\_Sea.shtml](http://www.eni.com/en_IT/media/press-releases/2015/08/Eni_discovers_supergiant_gas_field_in_Egyptian_offshore_the_largest_ever_found_in_Mediterranean_Sea.shtml).

Smaller gas fields in this area hold approximately 58 bcm.<sup>46</sup> To accomplish that, the construction of an East Mediterranean pipeline to Turkey via Cyprus, to carry Israeli and Cypriot gas, would be a game-changer, as it would eliminate a need in a costly LNG facility which would require an investment of US \$5-7 billion. A cost of such a pipeline would be a fraction of an LNG terminal.

THE DEVELOPMENT OF THE NATURAL GAS FIELDS IN CYPRUS, EGYPT, AND ISRAEL—ALONG WITH THE CREATION OF AN LNG TERMINAL AND/OR PIPELINE NETWORK BETWEEN THE PRODUCING, TRANSIT, AND CONSUMING COUNTRIES—WOULD BRING LONG-TERM BENEFITS TO EUROPEAN CONSUMERS.

Energy cooperation between Egypt, Cyprus, and Israel is crucial to Eastern Mediterranean energy development. Israel and Cyprus will require the and creation of an underwater gas pipeline and an LNG terminal. Energy interdependence may enhance security and stability among gas suppliers and recipients, including Jordan and the Palestinian territories. If Turkey cooperates, the system would bring gas from offshore Israel and Cyprus to the EU through Turkey, into the TANAP system, and into Europe via TAP and the modified Nabucco system.

However, if Ankara does not cooperate, Greece would become the transit country, creating one of the world's largest pipeline systems. In this scenario, a pipeline would route the gas from Israel and Cyprus to Crete and the rest of Greece. Another option envisages generation of electricity in Cyprus, which would be then supplied to Greece through an underwater cable. However, there are serious questions about the costs of all these plans. CNG may be another cost-effective solution for shipping gas to Europe.

The Eastern Mediterranean can and should play a vital role in reaching the EU's goals by supplying a portion of the additional 100 bcm/y of natural gas that may be needed over the next fifteen years. However, the offshore fields in the Eastern Mediterranean would compete with great volumes of natural gas coming from the Persian Gulf countries, principally Iran.

<sup>46</sup> "Israel's Leviathan Gas Reserves Estimate Raised by 16 Percent," *Reuters*, July 13, 2014, <http://www.reuters.com/article/2014/07/13/israel-natgas-leviathan-idUSL6N0P008Q20140713>.



## ALTERNATIVES TO RUSSIAN GAS—THE IRAN-EUROPE PIPELINE

Given the recent shift in relations between Iran and the EU, it is reasonable to assume that Iran's natural gas deposits, which are approximately 34 trillion cubic meters and the second largest in the world, could also contribute to European energy security. However, only 160 billion cubic meters of gas are produced annually, due to technological and financial constraints caused by domestic mismanagement, a lack of expertise, and the Western sanctions that now appear to be lifted. Only a small amount of Iran's annual gas production is currently being exported.

The Iranian energy industry will require massive investments to meet European and global demand. Currently, Iran supplies less than 1 percent of global natural gas exports. Building LNG export terminals would be an enormous prize, and one that the Iranian leadership is likely to reach for in the years to come. According to the US Energy Information Agency (EIA), Iran presently exports relatively small amounts of natural gas via pipelines to three neighboring countries—Turkey, Armenia, and Azerbaijan.<sup>47</sup> Thus, the existing Iran-Turkey pipeline, with its 14 bcm/y capacity and Turkish imports of 5.5 bcm/y, would be the first line of supply of Iranian gas to Europe, capable of providing up to 7 bcm/y. This could begin to happen in two to three years. Beyond that, there are plans to build a Persian Pipeline with a capacity of up to 40 bcm/y. Yet, natural gas is not the only fuel to generate electricity, and the Black Sea region's capacity to produce power from other sources is growing.

## ALTERNATIVES TO RUSSIAN GAS—COAL, NUCLEAR, AND RENEWABLES

Countries around the Black Sea boast considerable conventional-energy potential, including the capacity for generating nuclear power. For example, Ukraine has four active power plants with 14-gigawatt total installed capacity. The ill-fated Chernobyl reactor remains closed, and three other projects are unfinished (including one in Crimea). With large-scale industrial consumers of energy located in the occupied eastern regions of Ukraine, there are no current plans for expanding the existing facilities or building new ones.

Romania has one active power plant, with 1.4-gigawatt capacity. Future projects include a two-reactor power plant in Transylvania with 2.4-gigawatt capacity. These plans are long term and are unlikely to be implemented earlier than 2020.<sup>48</sup> The project will also involve imports of nuclear reactors from French companies.

Bulgaria operates one active power plant in Kozloduy, with two-gigawatt capacity, and there are plans to build a second power plant in Belene; but the project has been stalled for almost five years. Currently, Bulgaria has excess power capacity, and is exporting electricity. However, the cancellation of the South Stream might provide the impetus for restarting the project.

Turkey is developing two power plants, with four nuclear reactors in Akkuyu, a city on the Mediterranean coast, and four more in Sinop, on the Black Sea coast. The plant in Akkuyu is expected to become operational in 2020.<sup>49</sup> It will be based on Russian VVER reactors, whereas the one in Sinop will use Japanese and French technology.<sup>50</sup>

Russia possesses the most nuclear expertise among the countries in the region. It has ten nuclear power plants with thirty-four reactors. It also has another project under development, a floating nuclear power plant on the barge the Akademik Lomonosov, which is expected to become operational in 2016.<sup>51</sup> This mobile plant can be transported through the country's waterways. Although the initial goal of the project was to supply energy to Chukotka, a remote peninsula in northeastern Siberia, there were suggestions that the Lomonosov would become a major source of electricity for the energy-starved Crimea. However, due to the mobile reactor's cost and schedule overruns and the planned deployment to the Arctic, this plans appear to be postponed indefinitely.<sup>52</sup>

Large quantities of conventional energy are also produced in the region. Ukraine has lost its primary sources of coal since the beginning of war in the Donbas. Production fell from 8.3 million tons in 2013 to 6.5 million tons in 2014. It fell further in 2015 by 53 percent, as Ukraine's major coal-producing regions are under the control of separatists. While the amount of the imported coal in the first half of 2015 increased year after year, the value of coal imports in the first half of 2015 remained at \$857.5 million, close to the same period for 2014.<sup>53</sup> Ironically, Ukraine has increased its imports of coal from Russia, further undermining its energy security.

Romania imported 857 thousand tons of coal in 2013, with no domestic production. However, Romania does produce lignite, known as brown coal. More polluting than the more commonly used black coal, it is also considered to be of

49 "Ground Broken for Turkey's First Nuclear Power Plant," *World Nuclear News*, April 15, 2015, <http://www.world-nuclear-news.org/NN-Ground-broken-for-Turkeys-first-nuclear-power-plant-1541501.html>.

50 "Turkey, Japan Sign \$22 Bln Deal for Sinop Nuclear Plant," *Anadolu News Agency*, May 3, 2013, <http://www.hurriyetdailynews.com/turkey-japan-sign-22-bln-deal-for-sinop-nuclear-plant.aspx?pageID=238&nID=46206&NewsCatID=348>.

51 "Floating Plant to Be Delivered in 2016," *World Nuclear News*, October 23, 2014, <http://www.world-nuclear-news.org/NN-floating-plant-to-be-delivered-in-2016-23101401.html>. See also <http://www.b-port.com/tv21/item/160476.html>.

52 Vasily Petrov, "Two Reactors Awaiting 'Akademik Lomonosov' in Pevek," *Gazeta.ru*, August 26, 2015, [http://www.gazeta.ru/science/2015/08/26\\_a\\_7718603.shtml](http://www.gazeta.ru/science/2015/08/26_a_7718603.shtml).

53 "Ukraine Purchased Almost One Billion Dollars' Worth of Coal," *Korrespondent.net*, July 6, 2015, <http://korrespondent.net/business/financial/3536022-ukrayna-zakupyla-uhlia-pochty-na-myllyard-dollarov>.

47 US Energy Information Administration, "EIA Independent Statistics and Analysis," <http://www.eia.gov/countries/cab.cfm?fips=iz..>

48 World Nuclear Association, "Nuclear Power in Romania," October 2014, <http://www.world-nuclear.org/info/Country-Profiles/Countries-O-S/Romania>.



the lowest quality, due to its relatively low caloric value. According to Romania's Energy Strategy 2015-2035 draft,<sup>54</sup> the country's lignite production capacity is about 33 mt per year, with domestic consumption being 23 mt per year, resulting in an over-capacity of approximately 10 mt per year.

Bulgarian coal imports in 2014 were 1.4 mt, showing a decrease in coal consumption compared with the previous year (2.1 mt imported).

Turkey's thermal-coal imports were 23.5 mt in 2014, including the all-time largest purchases from Colombia (9.278 mt, a 30-percent increase from 2013) and South Africa.<sup>55</sup> Colombia ousted Russia (8.409 mt in 2014, a 2 percent decrease from 2013) as the main thermal-coal supplier to Turkey. 2014 coal imports marked the second highest on record, just after 2012's 23.725 mt, according to data from the Turkish Statistical Institute (TUIK).<sup>56</sup>

Georgia's coal imports are negligible. The country imported only 8.8 thousand tons in 2012. The country's energy needs were and are covered by natural gas from Azerbaijan and Russia, as well as local production.

As for renewables, despite their humble beginnings, they have an increasing role in achieving diversity of electricity supply sources. Energy producers can take advantage of local factors (such as the many mountain rivers of Georgia, the sunny weather in Turkey and Greece, and the strong winds of the Black Sea coast) to increase the share of renewables. Renewable power-generation costs will decline as these technologies develop and mature, although it is clear that the medium-income countries in the region do not have the deep pockets needed to subsidize their renewables on the same level as the countries of the Organization for Economic Cooperation and Development (OECD).

Natural gas cannot and should not be the only source of energy in the Black Sea basin. However, with its low carbon emissions relative to coal, and its great safety record in comparison to nuclear energy, it is the main transition source of energy until renewables become fully competitive. Thus, natural gas will remain the principal electricity-generating commodity for the region.

## CONCLUSION: "HAPPINESS IS MULTIPLE PIPELINES"—ENHANCING BLACK SEA ENERGY SECURITY BY 2025

A safe and peaceful Black Sea region is vital for European energy security, and for the economic development of US and European markets in this strategically important

region that abuts Russia, Iran, Turkey, the Middle East, and Europe. Energy policy in the Black Sea region is part of a broader economic and security policy paradigm that needs to be developed and implemented, with US support, by all littoral Black Sea states, and by the members of the EU.

US energy security priorities should include boosting the US military presence along the western littoral of the Black Sea, with special emphasis on air, naval, and Marine Corps assets. Cooperation, training, and interoperability among NATO allies, as well as between NATO and Ukraine and Georgia, should be a top priority. The use of the Crimea as a staging area for Russian operations in the Middle East threatens not only the Black Sea region, but also Turkey and the Eastern Mediterranean.

The US government, especially the Departments of State and Energy, should work with US energy companies—and with Georgia, Ukraine, and the United States' NATO allies, especially Turkey—to prioritize the development of new gas and oil fields offshore and on shore, around the Black Sea littoral and in the adjacent areas. Low tax rates, less red tape, in combination with manageable and diminishing graft will all go a long way toward attracting foreign investment in the region's energy sector. Ukraine, Romania, Georgia, northern Iraq, and the Eastern Mediterranean have sufficient potential to supply themselves, and possibly to diminish Europe's dependence on Russian gas by 50 percent by 2025-30.

Electricity-source diversification includes the limited usage of clean coal, as well as expanding nuclear energy and renewables, wherever economically justified.

New LNG terminals, including Krk Island in Croatia, the Baltic littoral (Poland and Lithuania), possibly Odesa, and South and Central European interconnectors, will be crucial for a diversified, reliable, and robust regional energy system. Therefore, Black Sea and Balkan countries should work on integrating all future energy infrastructure projects into a unified natural gas distribution system, as suggested above.

The Black Sea is already a major intersection of European energy trade. Its role will only increase, especially if the current disruptive policies of the Kremlin persist and if the Middle East remains unstable. Under current conditions, the link between the Southern Caucasus, Turkey, and Southern Europe may not only become an important part of the European energy infrastructure, but a strategic and vital one. Furthermore, natural gas from Central Asia (Turkmenistan) may find its way to Europe through this route as well.

Without a doubt, a deeper level of cooperation and coordination between the various governments and the energy companies involved will be required in order to create an interdependent energy system that promotes stability and peace.

<sup>54</sup> Anca Bernovici, "Domestic Coal Production, on the Rise. However, Romania Continues to Import," *Romania Journal*, May 10, 2015, <http://www.romaniajournal.ro/domestic-coal-production-on-the-rise-however-romania-continues-to-import>.

<sup>55</sup> "Turkey's 2014 Thermal Coal Imports Rise 13 Percent on Year to 23.56 Mil Mt," *Platts*, January 30, 2015, <http://www.platts.com/latest-news/coal/london/turkeys-2014-thermal-coal-imports-rise-13-on-26996414>.

<sup>56</sup> Ibid.

## ABOUT THE AUTHOR

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