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The Opening of the Southern Gas Corridor

Mariana Liakopoulou

Summary

The Southern Gas Corridor (SGC) is a 3,500-kilometre network of three pipelines: the South Caucasus Pipeline (SCP), Trans-Anatolian Pipeline (TANAP) and Trans-Adriatic Pipeline (TAP). The SGC's implementation seeks to satisfy the EU's strategic imperative, following disruptions of gas supplies from Russia via the Ukraine transit route in 2006 and 2009, to access new sources of gas in the Middle East and the Caspian regions. This research note aims to outline the benefits of this cross-border project for Southeast Europe and shed light on options for its expansion, as well as its role in the decarbonization of the European gas sector.



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Source: <https://upload.wikimedia.org/wikipedia/commons/0/0a/TAP_TANAP_SCP_Schah_Denis.png>.

The Opening of the Southern Gas Corridor

MARIANA LIAKOPOULOU

1 WHAT IS THE SOUTHERN GAS CORRIDOR?

The Southern Gas Corridor (SGC) is a 3,500-kilometre network of three pipelines: the South Caucasus Pipeline (SCP), Trans-Anatolian Pipeline (TANAP) and Trans-Adriatic Pipeline (TAP). It extends across six countries (Azerbaijan, Georgia, Turkey, Greece, Albania, Italy). Its total cost is estimated at \$45 billion. Its implementation seeks to satisfy the EU's strategic imperative, following disruptions of gas supplies from Russia via the Ukraine transit route in 2006 and 2009, to access "new sources of gas in the Middle East and the Caspian regions".¹

The SGC provides a reliable transit route for new gas supplies from the Caspian Sea and Central Asia regions to the EU. The SGC's start-up capacity is 16 billion cubic metres per year (bcm/y), which the development of the second stage of Azerbaijan's Shah Deniz gas condensate field (SD2) will satisfy. Turkey domestically consumes 6 bcm/y of that quantity, flowing via TANAP. The EU Members on board to import the remaining 10 bcm/y via TAP are Greece (1 bcm/y), Bulgaria (1 bcm/y) and Italy and adjacent markets (8 bcm/y).

As part of the SD2 development, the project's operator BP is implementing expansion of the SCP's capacity to 22 bcm/y. According to Azerbaijan's Energy Ministry,² 6.3 bcm of gas reached Turkey via TANAP between 30 June 2018 and 1 August 2020. TANAP is scalable to 23-31 bcm/y by 2023-2026, while TAP's throughput could be doubled to 20 bcm/y with the addition of several compressors. On 15 November 2020, TAP launched commercial operations.³ The pipeline's capacity is now available on the PRISMA European Capacity Platform.

All segments of the SGC have to operate at full capacity if the project consortia are to be guaranteed a reasonable return on investment and if costs are to be brought down for shippers. Additional, non-SD2 gas volumes will be necessary to achieve this full capacity.

2 WHO BENEFITS?

2.1 Benefits of the SGC for Greece

The SGC is a milestone for import-dependent Greece and will allow gas from the Caspian Sea region to diversify further the country's energy mix. Greece has already made a significant step in such a direction with imports of liquefied natural gas (LNG) via its expanded Revithoussa terminal. These volumes exceeded those flowing through the Sidirokastro entry point on its border with Bulgaria, which serves imports from Russia almost exclusively

¹ Jozias Van Aartsen, *Activity Report: September 2007 – February 2009; Project of European Interest n° NG 3* (Brussels: [European Union], 4 February 2009), <<https://zoek.officielebekendmakingen.nl/blg-12831.pdf>>.

² Ministry of Energy, Republic of Azerbaijan, "Gas production and exports increased over the seven months", 18 August 2020, <<https://minenergy.gov.az/en/xeberler-arxivi/yeddi-ayda-olkede-qaz-hasilati-ve-ixraci-artib>>.

³ TAP AG, "TAP Starts Commercial Operations", Press release, 15 November 2020, <<https://www.tap-ag.com/news/news-stories/tap-starts-commercial-operations>>.

(transited through Ukraine), for the first time in the first quarter of 2020.⁴ Greece has historically imported the largest share of its annual gas volumes via Sidirokastro, but, amid a general downturn in global commodities, it has been able to take advantage of lower LNG prices already evident since late 2019. The SGC will introduce yet another source of gas supply and, so doing, will increase still further the degree of competition in the Greek gas market.

The SGC thus enhances Greece's transit role, to the benefit of the whole of Southeastern Europe. That is because the SGC's extensive and complex pipeline network has stimulated knock-on investment in interconnectors that will form part of the Vertical Gas Corridor (VGC) running along the Greece-Hungary/Ukraine axis, starting with the Interconnector Greece-Bulgaria (IGB). As the EU mandates that countries in this geographic region should have at least three different sources of natural gas supply, Greece – the EU landfall country in the region for both Caspian gas and competitively priced LNG – will be able to offer these additional supply options to its northern neighbours.

2.2 Benefits of the SGC for Italy

Italy has identified SGC as an infrastructure project helping to realize the objective, set out in its National Energy Strategy⁵, to establish a diversified, secure, competitive, flexible natural gas system for the country. Other infrastructure projects so considered include East Med-Poseidon Pipeline Project (Cyprus-Greece-Italy) and regasification terminals for LNG imports. Such infrastructure will also increase the Italian gas market's liquidity, as more participants are likely to participate in Italy's Punto di Scambio Virtuale (PSV) virtual gas trading hub.

Moreover, the SGC will contribute to realizing Italy's broader, strategic aspiration to be a southern EU gas hub. Just like Greece, Italy will have the opportunity to distribute Caspian gas to Central Europe owing to its geographical position. The Italian market is set to remain competitive and balanced thanks to TAP volumes, which will likely help narrow the spread between PSV spot contracts and the Dutch Title Transfer Facility (TTF) ones. Finally, TAP will have a direct positive impact on the Italian electricity market, since gas represents nearly half of Italy's power-generation mix.

2.3 Benefits of the SGC for the Western Balkans

TAP will facilitate the eventual gasification of West Balkan countries lacking a commercial gas sector (such as Albania, Kosovo, and Montenegro) as well as those having small demand profiles – less than 0.5 bcm/y – that remain solely dependent on Russia (such as Bosnia-Herzegovina). The prospect of gasification in the Western Balkans was one of the advantages favouring TAP's shorter, less expensive route over the larger-scale Nabucco West project when the Shah Deniz consortium decided between them in 2013. Being shorter and less expensive, TAP could also be completed faster, as it would run a shorter distance towards nearby markets (*viz.*, Turkey, Greece, Albania, and Italy) and would grant sellers a higher netback (net revenues, i.e. gas sales price minus transportation costs) from the gas sold than Nabucco would have granted.

⁴ "Gas imports up 17% in first four months, LNG at the forefront", *Energypress*, 27 May 2020, <<https://energypress.eu/gas-imports-up-17-in-first-four-months-lng-at-the-forefront/>>.

⁵ Ministry of Economic Development and Ministry of the Environment and of Land and Sea Protection, Government of Italy, *Strategia Energetica Nazionale*, 10 November 2017, <<https://www.mise.gov.it/images/stories/documenti/Testo-integrale-SEN-2017.pdf>>.

TAP has incentivized implementation of such projects as the Ionian Adriatic Pipeline (IAP), which will Europeanize and gasify the energy consumption profiles of Albania, Montenegro, Bosnia and Croatia, as well as the Croatian LNG terminal on the island Krk, which is scheduled to start operations in January 2021. The latter provides the IAP's customers with additional supply options and also promotes north-south gas flows in the region. TAP has also incentivized the Albania-Kosovo Gas Pipeline (ALKOGAP), a bi-directional pipeline that is planned to interconnect Kosovo's future gas transmission system not only with Albania's but also with the interconnectors that are themselves part of the eastern branch of the Energy Community Gas Ring (ECGR).⁶ ALKOGAP would thus be a route for Caspian gas flowing from the northeast Western Balkan area towards Serbia.⁷ Commissioning of the IAP's branches is foreseen for 2023 (Croatia), 2025 (Montenegro) and 2026 (Albania), while that of ALKOGAP is foreseen for March 2027 in both Albania and Kosovo.

3 EXPANSION OF THE TRANS-ADRIATIC PIPELINE

Following TAP's non-binding market test phase,⁸ there was optimism about the pipeline's projected capacity expansion from 10 to 20 bcm/y. Since then, the market has become more uncertain. A second consecutive mild winter, coupled with the coronavirus outbreak, has

⁶ The term "Gas Ring" refers to an Energy Community gas infrastructure concept that aims at connecting all Contracting Parties (Albania, Bosnia-Herzegovina, Georgia, Kosovo, Moldova, Montenegro, North Macedonia, Serbia, Ukraine) via a ring, while also considering the Region's electricity requirements as well as the (existing or planned) regional pipelines, LNG terminals, and storage facilities that could be connected. For more information see: Energy Community Regulatory Board, "Regulatory Framework for the Development of the Energy Community Gas Ring: Discussion Paper on the Regulatory Instruments and Steps Necessary for the Development of the Natural Gas Market and Cross-Border Investments in the Energy Community", 10 March 2010, <https://author.energy-community.org/enc-author-prd/dam/jcr:1640e1b4-10d0-4ed8-8baf-22bf-ba4e4c93/ECRB_framework_Gas_Ring.pdf>.

⁷ Energy Community, "Gas_13 / Albania-Kosovo* Gas Pipeline (ALKOGAP)", <<https://www.energy-community.org/regionalinitiatives/infrastructure/PLIMA/Gas13.html>>.

⁸ TAP launched the first non-binding phase of its market test on 1 July 2019. Its consortium, along with the Greek and Italian gas grid operators – DESFA and Snam Rete Gas (SRG) – issued the results of the market test on 21 October 2019. According to the demand assessment report, the amount of non-binding demand necessitates technical studies for the expansion of the pipeline from 10 bcm/y up to 20 bcm/y, which is the pipeline's total capacity according to the 2013 Final Joint Opinion (FJO) of the energy regulators of Greece (RAE), Italy (AREERA) and Albania (ERE) on exempting TAP from certain provisions of the Third Gas Directive and Gas Regulation 715. That non-binding phase concluded with a public consultation on the draft project proposal, launched on 20 January 2020 by TAP, DESFA and SRG, in line with Article 27 of the Network Code on capacity allocation mechanisms (CAM NC) and the market test guidelines. The joint public consultation ended on 21 February 2020. The requested capacities are studied with respect to the offer levels described in the Project Proposal, which is issued for public consultation after the performance of technical studies. For more information see: TAP, SRG, and DESFA, "Demand assessment report for incremental capacity between Trans Adriatic Pipeline, Snam Rete Gas and DESFA – External document for publication –", 21 October 2019, <[https://www.tap-ag.com/shippers/market-tests/\\$14391/\\$14394/\\$14402](https://www.tap-ag.com/shippers/market-tests/$14391/$14394/$14402)>; and SRG, TAP, and DESFA, "Incremental capacity: SRG, TAP and DESFA Joint Public Consultation of the draft Project Proposal", <[https://www.tap-ag.com/shippers/market-tests/\\$14391/\\$14394/\\$14401](https://www.tap-ag.com/shippers/market-tests/$14391/$14394/$14401)>. The Joint Opinion of the Energy Regulators on TAP AG's Exemption Application is at: <http://www.rae.gr/site/file/categories_new/about_rae/factsheets/2013/gen/25072013?p=file&i=0>.

led to sluggish demand, while inventories are well above the season average across Europe. Benchmark prices have dropped below their 10-year average. As a result the TAP consortium (BP, SOCAR, and Snam, 20 percent each; Fluxys, 19 percent; Enagás, 16 percent; and Axpo, 5 percent), together with Greek and Italian transmission system operators DESFA and Snam Rete Gas (SRG), have postponed the second round of bidding for TAP's incremental capacity, which is binding, from early 2021 to the summer of 2021. They hope that this will provide time for energy markets to improve, so that the commercialization of TAP's capacity can continue smoothly.

TAP's expansion will depend on interest expressed throughout the booking phase of the first and upcoming market tests⁹ at an auction, which will be open to third parties as well as to TAP shareholders. TAP has been certified as an independent transmission operator (ITO) by the Albanian, Greek, and Italian national regulatory authorities, in line with the Third Energy Package. Qualifying shippers are therefore able to participate in TAP's open seasons on allocation of incremental capacity. In this context, the primary determinant of TAP's expansion is the supply that may become available from the Caspian Sea and Central Asia regions in the short-to-medium term. At present, new volumes from Azerbaijan are the most likely first source for TAP's future expansion. These are projected to be available after 2023 (see Section 4., below).

Turkmenistan is next most likely, thanks to construction of the domestic East-West Pipeline, which connects the giant Galkynysh field and other fields in the country's east to its Caspian Sea coast. The Caspian-region energy expert Dr. Robert M. Cutler notes that a viable business plan exists for realizing the Trans-Caspian Gas Pipeline (TCGP) project. He believes that thanks to that business road-map, the TCGP does not require a commercial champion, noting that TANAP was built without one as it was financed exclusively by the Azerbaijani government.¹⁰ He has also noted that Turkmen gas is closer to Europe than Siberian gas and less expensive enough than either Russian or Azerbaijani gas, that, according to him, the cost differential more than makes up for the transportation charges: the SGC infrastructure already exists and, as a result of the Second Karabakh War, there need no longer be any concern over Armenia cutting the gas corridor.¹¹

⁹ TAP is obliged to perform market tests on a regular basis starting from no later than the date when it enters commercial operations and, subsequently, at least every two years. For more information see: European Commission, "Commission Decision of 16.5.2013 on the exemption of the Trans Adriatic Pipeline from the requirements on third party access, tariff regulation and ownership unbundling laid down in Articles 9, 32, 41(6), 41(8) and 41(10) of Directive 2009/73/EC", Doc. C(2013) 2949 final (Brussels: European Commission, 16 May 2013), <https://ec.europa.eu/energy/sites/ener/files/documents/2013_tap_decision_en.pdf>.

¹⁰ Robert M. Cutler, "How Central Asian energy complements the Southern Gas Corridor", *EurActiv*, 24 January 2018, <<https://www.euractiv.com/section/energy/opinion/how-central-asian-energy-complements-the-southern-gas-corridor/>>; for details, Robert M. Cutler, "Third time lucky for Trans-Caspian Gas Pipeline?", *Petroleum Economist*, 6 June 2019, <<https://www.petroleum-economist.com/articles/politics-economics/europe-eurasia/2019/third-time-lucky-for-trans-caspian-gas-pipeline>>; for more background, Robert M. Cutler, "U.S. Push Could Revive Turkmen Gas Hopes", Radio Free Europe/Radio Liberty, 22 January 2018, <<https://www.rferl.org/a/commentary-turkmenistan-gas-hopes/28990352.html>>; also Robert M. Cutler, *The Trans-Caspian Is a Pipeline for a Geopolitical Commission*, Energy Security Program Policy Paper 1 (Toronto: NATO Association of Canada, March 2020), <<https://www.natoassociation.ca/wp-content/uploads/2020/04/Trans-Caspian-Pipeline-Geopolitical-Commission-ESPPP01.pdf>>

¹¹ For additional details, see further: Matthew Bryza, Robert M. Cutler, and Giorgi Vashakmadze, "US foreign policy and Euro-Caspian energy security: The time is now to build the Trans-Caspian Pipeline", *Ener-*

Decline of gas production in northwestern Europe and coal's phase-out will lead to increased European gas imports as soon as demand is restored to pre-COVID levels. LNG prices may also rise in line with the demand projections. All necessary studies for the TCGP have been completed, and preparatory documents formalized, according to Cutler. From that he concludes that Turkmen gas will satisfy Europe's demand, and that prospects for the TCGP are very good, if Turkmenistan takes active, visible steps to make it a reality.

Other Central Asian producers potentially interested in joining an extended, expanded SGC are Kazakhstan and Uzbekistan. Kazakhstan's upstream business is mainly driven by oil. More than half its gas production comprises associated gas. This fact limits how far and fast its marketable¹² gas can be ramped up. Nevertheless, exportable gas has increased by 40 percent in the past three years, reaching almost 20 bcm in 2019.¹³ Gasification of the country's capital Nur-Sultan and adjacent regions will remain a priority. Uzbekistan has been hurt by PetroChina's declaration of *force majeure* regarding Central Asian gas and by Gazprom's complete halt of purchases during the second quarter of 2020,¹⁴ Uzbekistan will now focus on domestic supply, which suffers chronic shortages, and on kick-starting its gas-to-liquids and plastics industries, according to the country's pipeline operator.¹⁵ Additional midstream investments are needed to enable Kazakhstan and/or Uzbekistan to join the SGC, diversifying their export markets away from China and Russia. The commercial viability of such infrastructure projects may be problematic in view of protracted low commodity prices.

4 THE "NEXT WAVE" OF GAS FROM AZERBAIJAN

Since 2018, Azerbaijan's gas production has exceeded 30 bcm/y, including marketable volumes of 20-25 bcm/y. According to Azerbaijan's Energy Minister,¹⁶ production could reach 45 bcm/y in 2022. If that level is attained, then a peak of 50 bcm/y could be in reach

gySource (blog), Atlantic Council, 12 June 2020, <<https://www.atlanticcouncil.org/blogs/energysource/us-foreign-policy-and-euro-caspian-energy-security-the-time-is-now-to-build-the-trans-caspian-pipeline/>>; most recently, interview of Robert M. Cutler by Michael Hilliard, "Who Controls the Caspian Sea?", *The Red Line*, (audio) Podcast 29, 1 November 2020, <<https://podcasts.apple.com/us/podcast/29-who-controls-the-caspian-sea/id1482715810>>, edited transcript appearing as Robert M. Cutler, interviewed by Michael Hilliard, *Euro-Caspian Energy Security and Geoeconomics*, Energy Security Program Research Brief 1 (Toronto: NATO Association of Canada, December 2020), <http://natoassociation.ca/wp-content/uploads/2020/12/Cutler_Euro-Caspian-Energy-Security-Geoeconomics_ESPRB1.pdf>.

¹² Natural gas that is available for sale for direct consumption as domestic, commercial or industrial fuel.

¹³ Interview of Kazakhstan's energy minister Nurlan Nogayev, in: "Oil production, gas supply and investment attraction – review of energy sector in Kazakhstan", Official Information Source of the Prime Minister of the Republic of Kazakhstan, 28 May 2020, <<https://primeminister.kz/en/news/reviews/oil-production-gas-supply-and-investment-attraction-review-of-energy-sector-in-kazakhstan>>.

¹⁴ On 5 March 2019, it was reported that PetroChina had issued a *force majeure* notice, slashing gas purchases from Kazakhstan, Turkmenistan, and Uzbekistan because of the demand destruction caused by Covid-19. Gazprom is believed to have declared *force majeure* on Central Asian gas as from late April 2020, when government-imposed lockdown measures around the world caused an acute decline in demand for oil. Gas trading volumes between Uzbekneftegaz and Gazprom fell to zero, from the start of 2020 until late June 2020.

¹⁵ Interview of Ulugbek Saaidov, chief of UzTransGaz, in: "Pochemu Uzbekistan nameren prekratit' eksport gaza", [Why Uzbekistan Intends To Stop Exporting Gas], *Gazeta.uz*, 10 March 2020, <<https://www.gazeta.uz/ru/2020/03/10/gas-processing/>>.

by the early 2030s. It is expected that amounts available for export from out of this total would be equal to or slightly more than TANAP's full post-2026 capacity of 31 bcm/y.

The quantity of gas that may be exported throughout the mid- and late 2020s remains contingent on Azerbaijan's own gas demand. Although gas occupies the largest share of Azerbaijan's total primary energy supply, domestic demand is limited mostly to electricity generation and heating. As soon as SD2 reaches plateau its production of 16 bcm/y, serving long-term sales contracts in place for Turkey (6 bcm/y) and European buyers (10 bcm/y), BP and partners could proceed with a third development phase (SD3), which could yield a further 10 bcm/y, by means of extra subsea compression.

The growth history of the Umid-Babek structure in Azerbaijan's offshore is similar to that of Shah Deniz. Gas from Umid, developed by SOCAR, is already being injected into Azerbaijan's gas transmission system. The field's second development stage has been postponed to 2022. The planned new platform at Umid could stabilize production at 3–4 bcm/y. Whether Babek comes online after 2022, with a potential plateau production level of 8 bcm/y, will be subject to investor interest. SOCAR and Equinor have agreed to develop another prospective source, the offshore Karabakh field, with a potential plateau production level of 2.1 bcm/y starting from 2025.

The second development phase of the offshore Absheron deposit is one of those projects that have already secured support from international oil companies. Absheron Phase 1 gas is destined for Azerbaijan's domestic market, with production starting as from early 2021 and reaching a level of 1.5 bcm/y. Under a production-sharing agreement (PSA) between SOCAR and Total, Absheron's second phase will add 5 bcm/y to that amount, potentially for export. Further additional exportable volumes may come from the promising Shafag-Asiman concession, which has an expected output level of 4–6 bcm/y under a PSA with BP, and from non-associated gas from the Azeri-Chirag-Gunashli oilfield cluster, developed by the ACG consortium. Given the long project lead times, the time horizon for bringing the earliest-available, new Azerbaijani production for export online is 2022–2023, with different fields projected to become available at different points in time over the course of the decade.

5 IRAN AS A POTENTIAL SGC SUPPLIER

There are several possibilities for Iranian gas to flow into the SGC, and so to into Europe. All are constrained principally by the sanctions regime re-imposed following the 2018 US withdrawal from the Joint Comprehensive Plan of Action (JCPOA).

5.1 The Possible Swap Deal with Turkmenistan

Iran and Turkmenistan have considered a swap arrangement whereby Turkmen gas would supply northern Iran, which lacks interconnections with the country's gas-rich south. Iran, for its part, would export equal volumes of gas to Turkey, destined for injection into TANAP. Current Turkmen gas export capacity to Iran is 20 bcm/y via two pipelines, one of which branches off from Turkmenistan's onshore Korpeje field to Kordkuy in Iran, and the

¹⁶ Ilham Shaban, "Gas Production in Azerbaijan to Be about 45 Bcm in 2022", *Caspian Barrel*, 4 July 2020, <<http://caspiabarrel.org/en/2020/07/gas-production-in-azerbaijan-to-be-about-45-bcm-in-2022/>>.

other of which connects Central Asia–Center gas pipeline system to the Khangiran gas refinery in Iran’s northeast.

The maximum volume of Iranian gas exports to Turkey is currently 14 bcm/y via the Tabriz-Erzurum-Ankara pipeline, which connects up with the SGC via the SCP, but this route has been subject to numerous cut-offs over the years. The two countries came up with the swap concept due to the absence of a major east-west pipeline running from Iran’s border with Turkmenistan to its border Turkey. Past gas-trade history between Iran and Turkmenistan has blocked any implementation of a swap agreement. Indeed, a protracted gas-debt spat between the two dating back to 2007–2013 has practically halted such trade since 2017. This year’s International Court of Arbitration ruling in favour of Turkmenistan resolved that issue,¹⁷ but existing sanctions may complicate Iran’s compliance.

5.2 The South-North Pipeline to Turkey

A major gas-pipeline system of 35 bcm/y linking Iran’s South Pars gas field reserves in the Persian Gulf with northwest Iran and the Turkish market has been bruited. This idea is mainly focused on the long-stalled Persian Pipeline, alternatively called the Iran-Turkey-Europe (ITE) pipeline, which would putatively render the Tabriz-Erzurum-Ankara pipeline obsolete.¹⁸ The ITE pipeline would run parallel to TANAP and TAP towards Central Europe. The Iran Gas Trunkline 9 (IGAT-9, the last in a series of large-diameter pipelines meant to gasify Iran along a south-to-north direction) is now complete, solving a chronic problem in Iran’s domestic gas market; it was supposed to be the ITE pipeline’s Iranian segment, but the ITE is unlikely to be constructed during the current low commodity-price cycle, unless some other arrangement is found allowing IGAT-9 flows to be exported directly into TANAP and TAP. Expansion of volumes into the underutilized Tabriz-Erzurum-Ankara pipeline, to be injected into TANAP, remains another option, but this is subject to the price competitiveness of Iranian gas versus oil-indexed Azerbaijani volumes.

Either option would require additional midstream investment that the present sanctions regime makes unlikely, since this would require participation by international oil companies. The US has offered a sanctions waiver regarding the passive 10 percent share of Iran’s NIOC in Azerbaijan’s offshore SD2 development. However, this waiver would not apply to midstream projects that could make Iran an SGC supplier, unless a new US administration in 2021 decides to revisit the JCPOA.

6 CONCLUSION

6.1 The SGC and Decarbonization in the EU’s Gas Sector

Potential for biomethane and/or hydrogen transport via the SGC was first highlighted in the aftermath of opposition, expressed by several Members of the European Parliament (MEPs), to including cross-border gas projects in the European Commission’s third List of

¹⁷ Sebastian Perry, “ICC panel rules in Turkmen-Iranian gas dispute”, *Global Arbitration Review*, 30 June 2020, <<https://globalarbitrationreview.com/icc-panel-rules-in-turkmen-iranian-gas-dispute>>.

¹⁸ Ilgar Gurbanov, “Removal of sanctions from Iran: What does it promise for the Southern Gas Corridor?”, *Energy Corridors Review*, 3 May 2015, <<https://energycorridors.wordpress.com/2015/05/03/removal-of-sanctions-from-iran-what-does-it-promise-for-the-southern-gas-corridor/>>.

Projects of Common Interest (2018).¹⁹ Since then two TAP shareholders, Snam and SOCAR, have signed a cooperation agreement providing for research on the possible construction of anaerobic digestion plants for production of biogas and biomethane, as well as for research on hydrogen production.²⁰ These two companies will have to distinguish between the main production technologies and their associated infrastructures, in order to determine the feasibility of transporting and/or storing any green gases (i.e. biogas/biomethane, and hydrogen sourced either from natural gas or renewable electricity) at all via the SGC.

Biogas and biomethane have system-benefits similar to those of natural gas (storage, flexibility and high-temperature heat, minus the net carbon emissions) and therefore can use existing gas-transmission pipelines without technical modifications. Because this is not the case with hydrogen, discussion about it focuses on “blending” into Europe’s existing natural gas grid. The proportion of hydrogen blending, into existing infrastructure and end-user equipment across Europe, that is possible without requiring technical issues be raised, varies from 0.01 percent to 20 percent.²¹

Hydrogen produced close to the point of electricity-generation or to the natural gas from which it is itself generated, requires dedicated pipelines or trucks. If hydrogen production is decentralized (i.e. produced close to the consumption point, typically at large consumer clusters), then infrastructure needs for local storage and distribution are limited.²² Retrofitting the existing natural gas infrastructure would be necessary but would not be a panacea.

Cross-border gas pipelines, including the SGC and networks like it, become economically advantageous over the shipping of liquefied hydrogen when the exporting and importing countries or regions are nearby. The SGC’s ability to carry hydrogen admixtures will depend upon which hydrogen production and delivery technologies may be implemented on a larger scale in the countries that the project crosses, as well as in those countries that are going to supply the SGC network. Decisions about this would determine the levels of investment that the project consortia would need to commit, in order to re-purpose the SGC’s various segments for the conversion, transmission, storage, and distribution of green gases.

6.2 Energy Security and the SGC

In the pertinent literature, one of the key threats affecting energy security conditions, for importers and exporters alike, is regional conflict, be this politically or economically motiv-

¹⁹ Marco Alvera, “Building energy infrastructure is not a zero-sum game”, *EurActiv*, 27 April 2018, <<https://www.euractiv.com/section/energy/opinion/building-energy-infrastructure-is-not-a-zero-sum-game/>>.

²⁰ Snam. “Snam and SOCAR Sign an Agreement to Promote Sustainable Energy”, Snam press release, 20 February 2020, <https://www.snam.it/en/Media/Press-releases/2020/Snam_and_Socar_sign_an_agreement_to_promote_sustainable_energy.html>.

²¹ Mariana Liakopoulou, *Towards an EU Hydrogen Economy: Policy and Energy Security Perspectives*. (Athens: Hellenic Foundation for European and Foreign Policy, November 2020), <<https://www.eliamep.gr/wp-content/uploads/2020/11/Policy-Paper-Liakopoulou-43.pdf>>.

²² Jan Cihlar, Ainhoa Villar Lejarreta, Anthony Wang, Fatima Melgar, Jaro Jens, and Philippe Rio, *Hydrogen generation in Europe: Overview of costs and key benefits*. (Luxembourg: Guidehouse, Tractebel Impact, July 2020), <https://op.europa.eu/en/publication-detail/-/publication/7e4afa7d-d077-11ea-adf7-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search>.

ated. In the case of the SGC, for example, BP suspended shipments via the SCP for security reasons over the short term during the 2008 Georgia-Russia conflict. For importers, energy security is all about adequate and reliable supplies at reasonable prices. For exporters, their reputation as reliable suppliers, and of course guaranteed revenues from end-markets, is what matters.

The overall commercial rationale for the SGC is particularly strong for transit countries (which also consume some imported gas) such as Turkey, Greece, Albania, and Italy. This commercial rationale has to do with diversification of gas supplies and increased opportunities to negotiate better prices from Gazprom. For this reason, scenarios concerning disruption of any SGC gas flows are now regarded as low-risk.