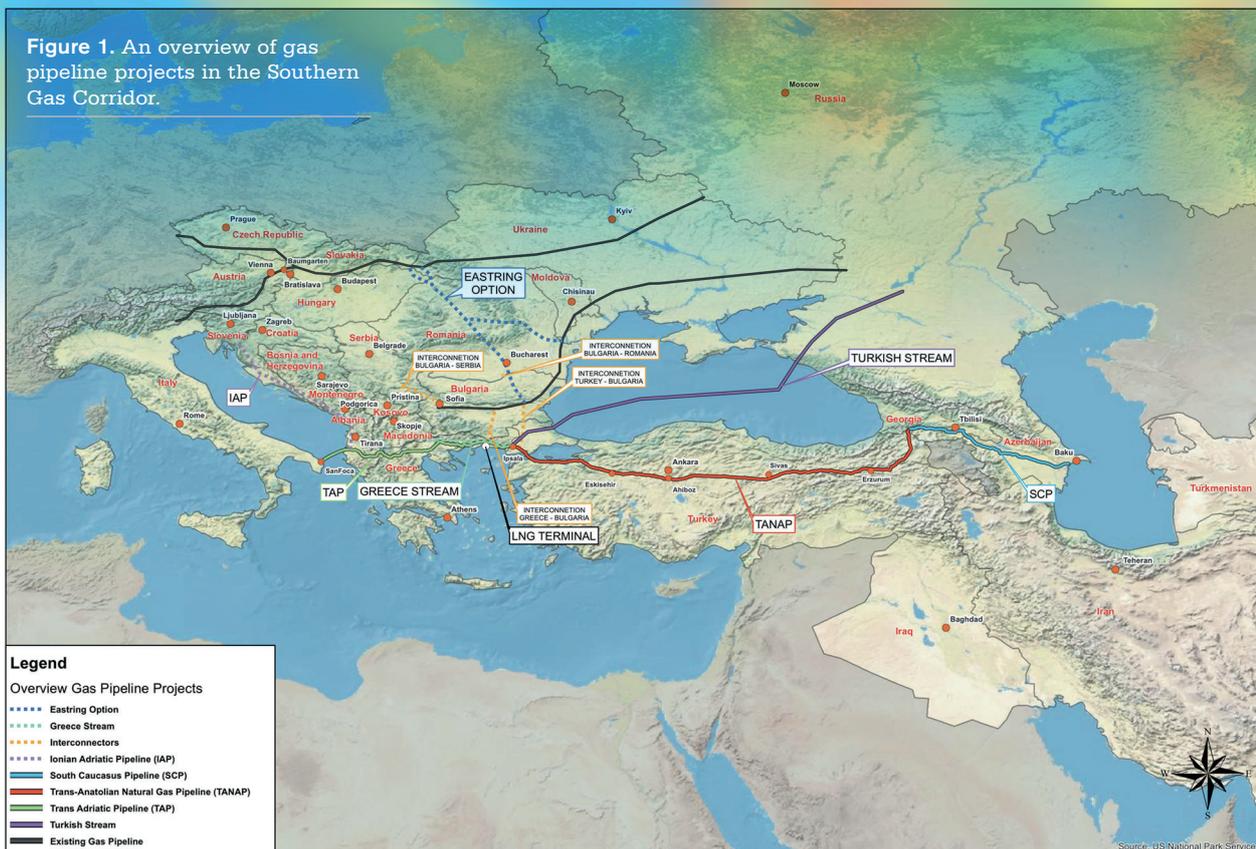


# The role of the SOUTHERN GAS CORRIDOR

Dr. Stefan Buerkle and Charlotte Huebner, ILF Consulting Engineers, Germany, give an update on the gas transmission landscape in southeastern Europe and South Caucasus with particular reference to the Southern Gas Corridor.

The Ukraine crisis has intensified debates on Europe's security of gas supply. Referring to the European Commission's (EC) 2020 Energy strategy, European security of gas supply is only to be achieved by the diversification of external gas routes to the EU market and by increasing flexibility in the internal gas market by developing interconnecting infrastructure.<sup>1</sup>

In 2013, the EU-28 member states imported 66% of its overall gas consumption.<sup>2</sup> Europe's gas dependency has increased over the last years, mainly due to the dwindling of domestic production of natural gas, and this trend is likely to continue in the long run, despite the persistently low demand. Since the financial crisis and with the push to



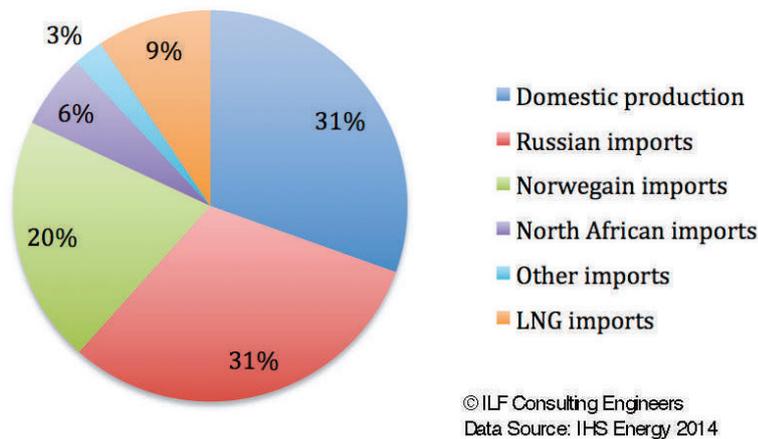


Figure 2. EU gas supply in 2014.

renewable energies, gas demand had dropped from almost 522 billion m<sup>3</sup> in 2010 to 461 billion m<sup>3</sup> in 2013.<sup>3</sup> At the same time, according to the International Energy Agency (IEA) Europe's gas production in 2020 is expected to be 25% below its 2010 level.<sup>4</sup> As a consequence, EU gas import requirements are to increase by almost one-third between 2014 and 2020.<sup>5</sup>

In order to meet EU demand, gas is currently imported through three large corridors: the eastern corridor from Russia, the northern corridor from Norway, and the Mediterranean corridor from Libya and Algeria. In addition, LNG is imported, with Qatar and Algeria being Europe's leading LNG providers. Imports from the US have also been growing since the shale gas boom.<sup>6</sup> LNG supplies are expected to further grow over the next five years and Europe is set to offer an important outlet.<sup>7</sup>

### The Southern Gas Corridor – diversification of gas supplies to European markets

A fourth gas entry route, the Southern Gas Corridor, carrying Caspian gas and potentially gas from the Middle East and Central Asia, has been recognised by the EC for its strategic importance in terms of EU's energy security.<sup>8</sup>

This megaproject, which requires approximately US\$45 billion of investment,<sup>9</sup> involves the construction of three major pipeline sections, in total stretching across 3500 km to provide an export route to Europe for Azerbaijan's offshore Shah Deniz 2 gas field in the Caspian Sea: the South Caucasus Pipeline (SCP), the Trans-Anatolian Gas Pipeline (TANAP) and Trans-Adriatic Pipeline (TAP). SCP is already in place, but requires capacity extensions, while TANAP and TAP are yet to be constructed.

As the main source of supply to the Southern Gas Corridor, BP's Shah Deniz 2 gas field will deliver 16 billion m<sup>3</sup>/yr of gas through the Sangachal Terminal in Baku, Azerbaijan into the expanded South Caucasus Pipeline (SCPX), which runs via Tbilisi to Erzurum in Turkey along

the route of the Baku-Tbilisi-Ceyhan (BTC) crude oil pipeline.

Since 2006, the SCP (692 km, 42 in.) has been jointly operated by BP and Statoil to supply markets in Turkey and Georgia. The current SCPX project involves the looping of the SCP in Azerbaijan and partially in Georgia, as well as the construction of two new compressor stations in Georgia to increase the overall capacity to 23 billion m<sup>3</sup>/yr.<sup>10</sup>

TANAP is now being constructed. It is one of the longest pipeline projects in the world at over 1841 km in length, 56 in. diameter and 16 billion m<sup>3</sup>/yr capacity, with a planned expansion to 31 billion m<sup>3</sup>/yr. The ground-breaking ceremony for TANAP – the longest

and most expensive element of the Southern Gas Corridor – in the city of Kars north-east of Turkey in March this year, marked a major milestone in the Southern Gas Corridor's development.

The impressive, US\$10 billion pipeline,<sup>11</sup> which includes a Marmara sea crossing section as well as multiple compressor stations, will cross the whole country from east to west, traversing 20 provinces, 67 districts and nearly 600 villages and mountains up to 2800 m above sea level. TANAP is being developed by a consortium consisting of SOCAR, BOTAS, and BP. ILF Consulting Engineers, a German engineering consultant with 35 years of project history in Turkey was awarded the Project Management and Owner's Engineering (PMOE) contract in the initial phases of the project and now continues to support the integrated management team of TANAP, while an EPCM contract was awarded to WorleyParsons Resources and Energy, London.

Turkey will receive 6 billion m<sup>3</sup>/yr from TANAP. Starting at the border to Greece, TAP will transport the remaining 10 billion m<sup>3</sup>/yr, which is destined for Europe across 870 km via Albania and the Adriatic Sea to Italy. According to the Front-End Engineering Design (FEED) for the pipeline, which was completed by ILF in 2012, phase one of TAP will have a capacity of 10 billion m<sup>3</sup>/yr. However, the pipeline system is designed so that its capacity can be doubled to 20 billion m<sup>3</sup>/yr in a potential phase two.

By the end of 2015, major procurement contracts will be awarded. With the Italian government having signed its final approval, the construction of the pipeline is expected to start in 2016. First gas is expected to be delivered in 2020.<sup>12</sup>

TAP was preferred as the western extension by the TANAP shareholders over the Nabucco West project, which was designed to cross Bulgaria, Romania, and Hungary and to finish in Austria. TAP joint venture's shareholders are BP (20%), SOCAR (20%), Statoil (20%), Fluxys (19%), Enagás (16%) and Axpo (5%).

TAP will be connected to the Italian natural gas grid and Azeri gas is expected to reach further countries in Western Europe, including but not limited to Austria, Germany and France or Switzerland.

### **Supplying Balkan and eastern European countries: demand for interconnecting gas infrastructure**

To guarantee security of supply, particularly for those Balkan and central European countries that are suffering from single-source dependency from Russian gas, TAP will include reverse flow features, allowing gas to be diverted from Italy to these countries.<sup>13</sup> There are also discussions to connect the TAP to regional pipeline systems such as the planned 5 billion m<sup>3</sup>/yr Ionian Adriatic Pipeline (IAP) in order to supply Montenegro, Bosnia and Herzegovina and Croatia. Also, Easting has been proposed to interconnect gas infrastructure between Bulgaria, Romania, Hungary and Slovakia.

The construction of LNG receiving terminals on the Adriatic shore may also support the diversification of sources of supply to the Balkan countries, which could be cut off from the TAP bypass. This has found support in the EC. To promote a more flexible and integrated internal gas market, the EC has identified so-called 'Projects of Common Interests' (PCI) including interconnecting infrastructure, LNG terminals and reverse flow pipelines, which are benefiting from EU funding and other incentives.

As an example: to diversify imports from Russia to Bulgaria, the following interconnectors are planned: Interconnection Bulgaria-Romania (IBR); Interconnection Greece-Bulgaria (IGB); Interconnection Turkey-Bulgaria (ITB); and Interconnection Bulgaria- Serbia (IBS).

### **The rise of the Turkish Stream**

While the EU plans to diversify its gas imports, Russia is looking to expand its exports to Europe. Russia is moreover planning to bypass Ukraine as a gas transit country and to reduce its transit dependency with a targeted exit by 2019.<sup>14</sup> Therefore, northern and southern bypass-routes are being considered. On the one hand, this has become evident with the recent agreement between Gazprom and its partners to expand its Nord Stream pipeline across the Baltic Sea to Germany. On the other hand, Turkish Stream has been launched. This pipeline connection through the Black Sea redirects the former South Stream project to Turkey, after the EU's Third Energy Package impeded its realisation on EU territory on legal grounds.

Gazprom and BOTAS have signed a memorandum of understanding (MoU) for the construction of a new gas pipeline, 1090 km in length with an overall capacity 63 billion m<sup>3</sup>/yr for all four pipes, to run on the bottom of the Black Sea basin to the Turkey-Greece border.

So far, all negotiations have only involved one 16 billion m<sup>3</sup> pipeline.<sup>15</sup> According to Turkish Energy Minister, Taner Yildiz, Gazprom has already delivered co-ordinates for the routing of the onshore section.<sup>16</sup>

The pipeline is expected to be laid onshore near the Turkish village of Kiyikoy and will then be connected with the Turkish-Greek gas hub at the border checkpoint at Ipsala.<sup>17</sup> Russia and Greece have signed an MoU on the extension of Turkish Stream from this point onwards through Greek territory.<sup>18</sup> According to IHS (2015), it is not expected that Turkish Stream would impact the Southern Gas Corridor project, with all investments under way and firm long-term contracts signed.<sup>19</sup>

### **Future outlook**

Future gas supplies to Europe along the southern corridor and further developments on the eastern corridor clearly depend on Turkey's path towards becoming a major gas transit country.

As announced in December 2013 by the Shah Deniz consortium, 100% of the initial capacities of both TANAP and TAP are secured by 25 year long-term agreements. Nevertheless, there are speculations as to what extent other regional players might supply TANAP in addition to the committed amount delivered by Azerbaijan.

In 2013, Turkmenistan and Turkey agreed on connecting Turkmen gas supplies to TANAP. However, plans for the Trans-Caspian Pipeline to bring Turkmen gas to the EU across the Caspian Sea needs to be realised before this can happen. This remains difficult due to political and legal disputes regarding Caspian seawater boundaries. Turkmenistan has rather shifted its export strategy to China.<sup>20</sup>

With Iran having a 10% stake in the Shah Deniz Consortium through Naftiran Intertrade Company (NICO) – a subsidiary of National Iranian Oil Company – post-sanctions Iran might have a future role in the Southern Gas Corridor.<sup>21</sup> Besides transporting gas through TANAP, a potential revival of the Iran-Turkey-Europe (ITE) pipeline might be also possible. However, as forecasted by BMI, there is only limited export potential until 2025 due to internal demand, the lack of spare gas for exports, and absence of production and export infrastructure.<sup>22</sup> The Kurdistan Regional Government in Iraq (KRG) also has the potential to supply Turkey with gas. Until now, disputes with the Federal Iraqi Government regarding outstanding payments have impeded investments and the development of necessary treatment and export infrastructure, for example an Erbil-Ceyhan gas pipeline.

Initially, the EC expected a rather ambitious supply rate of roughly 10 - 20% of EU gas demand by 2020 (45 - 90 billion m<sup>3</sup>/yr) from the Southern Gas Corridor.<sup>23</sup> It has become clear, though, that these targets will not be met, at least in the foreseeable future. Initially, TANAP will have a capacity of 16 billion m<sup>3</sup>/yr when entering Turkey, which is

planned to be expanded to 31 billion m<sup>3</sup>/yr by 2031. Because 6 billion m<sup>3</sup>/yr of Azeri gas are to be used for domestic consumption in Turkey, only a remaining 10 billion m<sup>3</sup>/yr will be crossing the border to Greece for further transport to Europe. This corresponds to only about 2% of the total European gas demand, and will therefore not radically change EU security of gas supply for now. Nevertheless, the Southern Gas Corridor is a significant step towards a more diversified gas supply architecture in Europe.

Once the political and financial obstacles and infrastructure bottlenecks are overcome, there is enormous potential for expansion in terms of existing pipeline capacities and new supply routes. 

## References

1. EU Commission, 2010, 'Energy infrastructure priorities for 2020 and beyond – A Blueprint for an integrated European energy network', available at: [https://ec.europa.eu/energy/sites/ener/files/documents/2011\\_energy\\_infrastructure\\_en.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2011_energy_infrastructure_en.pdf), accessed 30.06.2015; repeated recently in the Energy Union Framework Strategy, 2015.
2. EU Commission, 2015, 'Imports and secure supplies', available at: <http://ec.europa.eu/energy/en/topics/imports-and-secure-supplies>, accessed 30.06.2015.
3. Eurogas, 2011/2015 'Press Release - Evolution of Gas Consumption 2010' and 'Press Release- New Eurogas data confirms dynamic EU gas market'; estimated gas demand based on EU-27 Gas consumption in 2010 and EU-28 Gas consumption in 2013; due to warm weather EU-28 gas consumption has dropped to 409 billion m<sup>3</sup> in 2014.
4. International Energy Agency, 2015, 'Medium- Term Gas Market Report 2015'.
5. Ibid.
6. Eurogas, 2014, 'Eurogas Statistical Report, 2014'.
7. International Energy Agency, 2015, 'Medium- Term Gas Market Report 2015'.
8. EU Commission, 2015, 'Southern Gas Corridor: Vice-President Sefcovic attended Ministerial Meeting in Baku' available at <https://ec.europa.eu/energy/en/news/southern-gas-corridor-vice-president-%C5%A1ef%C4%8Dovi%C4%8D-attended-ministerial-meeting-baku>, accessed on 30.06.2015.
9. TAP Ag, 2015, <http://www.tap-ag.com/>, accessed on 30.06.2015.
10. BP, 2015, <http://www.tap-ag.com/>, accessed on 30.06.2015.
11. APA, 2015 [http://en.apa.az/xeber\\_foundation\\_of\\_tanap\\_\\_\\_s\\_turkish\\_part\\_to\\_be\\_224480.html](http://en.apa.az/xeber_foundation_of_tanap___s_turkish_part_to_be_224480.html), accessed on 30.06.2015.
12. TAP Ag, 2015, <http://www.tap-ag.com/>, accessed on 30.06.2015.
13. HAFNER, 2015, 'The Southern Gas Corridor and the EU Gas Security of Supply: What's Next? The Caspian Report', available at <http://www.caspian-report.com/the-southern-gas-corridor-and-the-eu-gas-security-of-supply-whats-next>, accessed on 30.06.2015.
14. Gazprom Deputy CEO Alexander Medvedev stated: "We will not export gas via Ukraine after 2019. The customers will get gas at (newly) agreed delivery points," available at: <http://www.euractiv.com/sections/energy/gazprom-reaffirms-plans-bypass-ukraine-2019-315264>, accessed on 30.06.2015.
15. Press release, Office of the Prime Minister, 15.06.2015, available at: <http://www.byegm.gov.tr/english/agenda/route-defined-for-turkish-stream-awaiting-finalapproval/> 81352, accessed on 30.06.2015.
16. Sputnik, 2015, available at: <http://sputniknews.com/business/20150615/1023396248.html#ixzz3e9w58BZT>, accessed 30.06.2015.
17. Reuters, 2015, 'Greece, Russia to cooperate on Turkish Stream pipeline', available at: <http://www.reuters.com/article/2015/06/19/energy-russiagreece-idUSR4N0XJ00220150619>, accessed 30.06.2015.
18. IHS, 2015, Eurasia Transportation Forum Summit, 25.06.2015 Istanbul.
19. Ibid.
20. ECFR, 2015, 'Europe's alternatives to Russian gas', available at: [http://www.ecfr.eu/article/commentary\\_europes\\_alternatives\\_to\\_russian\\_gas311666](http://www.ecfr.eu/article/commentary_europes_alternatives_to_russian_gas311666), accessed on 30.06.2015.
21. Natural Gas Europe, 2015, 'Removal of Sanctions from Iran: What does it promise for the Southern Gas Corridor?' available at: <http://www.naturalgaseurope.com/removal-of-iran-sanctions-and-southern-gas-corridor-23389>, accessed on 30.06.2015.
22. BMI, 2015, 'Iran-Europe: No gas export market to 2024'.
23. EU Commission, 2010, 'Energy infrastructure priorities for 2020 and beyond – A Blueprint for an integrated European energy network', available at: [https://ec.europa.eu/energy/sites/ener/files/documents/2011\\_energy\\_infrastructure\\_en.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2011_energy_infrastructure_en.pdf), accessed 30.06.2015.