Chapter 5. The essential energy contracts between international energy concerns of the world and countries of the Caspian Region. The significant energy fields

Abstract *This chapter is one of this project's most extensive and essential sections. It deals with a detailed analysis of the oil and gas projects. Moreover, the chapter covers some significant aspects of the projects, such as the construction, technical characterization, shareholders' share, etc. For instance, one of the most significant contracts in the energy history of the Caspian Sea, which is called the "pathbreaker" for the Caspian states after the fall of the USSR, is "the Contract of the Century" signed between Azerbaijan and different energy companies of the world in 1994. This chapter examines, in detail, not only the "Contract of the Century" but other essential energy deals such as the TANAP, the TAP, and "Shah Deniz 1," "Shah Deniz 2" projects between the Azerbaijani government and foreign energy companies. The Kashagan oil field of Kazakhstan and the Galkynysh gas field of Turkmenistan are also considered in this chapter.*

5.1 "The Contract of the Century"

The energy deal signed between Azerbaijan and international energy companies concerning the exploration and development of the ACG fields on 20 September 1994 led to substantial changes in the energy sector and Azerbaijan's political life, and it brought with itself a new political constellation to the Caspian Region. Consequently, the energy deal encouraged other newly independent states of the Caspian Region-Kazakhstan and Turkmenistan, to collaborate with the energy sector's critical international companies to drill and develop the oil and natural gas fields. Thus, this deal opened the way to private investment in the hitherto state-controlled oil sector.

However, Russia was against the involvement of Western energy companies in developing the Caspian Sea resources. The Russian and Iranian governments used the Caspian Sea's legal status as an effective political tool against international states and energy companies' participation in developing the region's oil and natural gas

resources. Consequently, both governments considered Western energy companies' involvement as a threat to their geopolitical interests.[1]

Ramco S. Remp, the British oil company representative, became the first official representative of one of the most significant Western oil companies who visited Azerbaijan's capital in 1989. He wrote later: "…Hundreds and hundreds of wells, all in bad condition. But nowhere is the presence of the West. As though time has stopped here."[2]

The authorities of the Azerbaijan Soviet Socialist Republic (Azerbaijan SSR) managed to establish some essential partnership connections with significant oil and gas companies such as BP, Statoil, and Amoco. These energy enterprises started playing an active role in the oil industry of Azerbaijan. Therefore, three Western energy companies: BP, Unocal, and Amoco, took part in the Baku-organized energy tender for oil and gas exploration in Azerbaijan in June 1991. Amoco won the bid, and the company's representatives later visited Baku.[3]

One of the most important events for that time was the official visit of the US minister of trade, T. McBride, in June 1991, who met with the president of Azerbaijan SSR, Ayaz Mutalibov. The cooperation between the two countries in the oil and gas sphere was the main topic of the meeting. Since nobody doubted the SU's temporal existence, as the West was actively seeking energy partners in the former SU, the visit was seen as a positive signal toward future partnerships between Azerbaijani and Western energy companies.[4]

Meanwhile, the political situation in Azerbaijan was characterized by absolute chaos and instability. Azerbaijani President Ayaz Mutalibov was forced to resign after the massacre and occupation of Khojaly by Armenian forces on the eve of the singing of "the Contract of the Century" by the first government of the newly declared Republic. Meanwhile, the occupation of Khojaly was realized with the close participation of the 366th infantry regiment of the former SU. At least 600 civilians were killed, and hundreds were injured or are still missing.[5]

The newly proclaimed state faced political problems, and there were numerous economic problems alongside political instability in the country. Consequently, Azerbaijan's financial situation was characterized by severe inflation issues at the

1 Aslanlı, A. (2009). Azerbaijan-Russia relations: Is the foreign policy strategy of Azerbaijan changing? Turkish Policy Quarterly, 9(3).

2 Polukhov, E. (1997). «Kontrakt veka» (problema v istoriecheskoz retrospektive). Kavkazskie Reqionalniye Issledovaniza, 2(1). ("The Contract of the Century," A problem in a historical retrospective, the Caucasian Regional Researches) Vol. 2, Issue 1, 1997.

3 Ibid.

4 Ipek, P. (2008). Azerbaijan: Oil boom and challenges. Turkey's neighborhood, 111–141.

5 Cornell, S. E. (2015). Azerbaijan since independence. Routledge.

highest level, low GDP, mass unemployment, etc.[6] It wouldn't have been possible to solve these significant problems without a close energy partnership with the West[7] and the western energy companies.[8] Additionally, another considerable dividend of the energy deal was a relative neutralization of Russian political influence over Azerbaijan.[9]

After the resignation of the communist president Ayaz Mutalibov, Abulfaz Elchibey, who became the first democratically elected president of the Republic, came to power. Even though Abulfaz Elchibey was elected through a democratic election, he faced tremendous political pressure from Russia and Iran because of his "panturkist"[10] political views. However, the most crucial reason for Russia and Iran's discontent was Elchibey's West-orientated political course.[11]

In August 1993, Abulfaz Elchibey was officially stripped of his presidency through a referendum. Heydar Aliyev, a former Soviet Politburo member, and former KGB General, was elected the Republic's president after the next election in October 1993.[12]

The traditional powers and neighboring countries of Azerbaijan, Russia, and Iran originally had no interest in participating in the energy deal between Azerbaijan and Western states due to Moscow's and Tehran's geopolitical interests. However, they agreed to be part of "the Contract of the Century" after the Azerbaijani government negotiated with the Russian and Iranian governments.[13] This, however, did not translate into trouble-free access for Azerbaijan to the world energy market. Creating the new pipeline routes to transport energy resources to the world energy markets was another critical issue that had tremendous significance for transporting Azerbaijani energy resources to the world energy market.[14] Nevertheless, an official agreement was signed between Azerbaijan and the international energy companies on 20 September 1994 despite all Azerbaijan's political and economic problems.

6 Ibrahimov, R. (2010). Azerbaijan Energy Strategy and the Importance of the Diversification of Exported Transport Routes. Journal of Qafqaz University, (29).

7 Mammadov, S. (2013). Azerbaijan. EEJ, 3, 80.

8 Guliyev, F. (2014). The'Contract of the Century'20 Years after. Available at SSRN 2498276.

9 Ismailzade, F. (2006). Russia's energy interests in Azerbaijan. GMB Publishing Ltd.

10 The terminology implies the cultural and political unification of all Turkic peoples.

11 De Waal, T. (2018). The Caucasus: an introduction. Oxford University Press.

12 Ibrahimov, R. Azerbaijan Oil Production as a Main Locomotive of State Economy.

13 Nassibli, N. (2003). Iran's Caspian Policy: Time to Make a Decision? Central Asia-Caucasus Analyst, 10.

14 Ibrahimov, R. (2010). Azerbaijan Energy Strategy and the Importance of the Diversification of Exported Transport Routes. Journal of Qafqaz University, (29).

5.1.1 The signing of the contract and member companies of the agreement

The "Contract of the Century" was signed in Azerbaijan, Baku, in Gulistan Palace, in September 1994 and was valid for the next 30 years. This energy deal is known as the "Contract of the Century." The contract has this definition because of its significant political and economic resonance in Azerbaijani energy history and the energy companies in the oil and gas sector of the newly proclaimed countries of the Caspian Region to sign the new energy deals with the Western energy companies.

PSA concerning the development of the deep-water oil fields "Azeri," "Chirag," and "Gyuneshli" comprised 400 pages and four languages. The signing process of the contract took place with the participation of the 13 energy companies. Consequently, realizing such a significant deal gave an impetus for the signing of the following oil agreements in Azerbaijan. Soon after, 26 contracts with the participation of 41 oil companies from 19 countries were signed.[15]

Moreover, this project's realization initiated the creation of some essential working structures like the Steering Committee, Azerbaijan International Operating Company (AIOC), and the Consulting Council. The National Assembly of Azerbaijan ratified the energy agreements in December 1994.[16]

Members of the agreement initially taking part in the singing of "the Contract of the Century" and their shares:[17]

- SOCAR (Azerbaijan) – 20%,
- "British Petroleum" – (Great Britain)-17,127%,
- "Amoco" (USA) – 17,01%,
- "Lukoil" (Russia) – 10%,
- "Pennzoil" (USA) – 9, 82%,
- "Unocal" (USA) – 9, 52%,
- "Statoil" (Norway) – 8,563%,
- "McDermott International" (USA) – 2,45%,
- "Ramco" (Great Britain) – 2,08%,
- "TRAO" (Turkey) – 1,75%,
- "Delta-Nimir" (Saudi Arabia) – 1,68%.

It appeared some changes in the list of the members of the energy deal and their stocks in the agreement as time passed. Consequently, the Turkish company TPAO

15 Prezident.az. Oil and Gas Projects. Retrieved April 27, 2023, from http://web.archive.org/web/20210403003907/https://en.president.az/azerbaijan/contract

16 Prezident.az. Oil and Gas Projects.

17 Sagheb, N., & Javadi, M. (1994). Azerbaijan's 'Contract of the Century'finally signed with Western Oil Consortium. Azerbaijan International, 2(4), 26–28.

and Iran received 5%, respectively, in November 1994.[18] Since it was principally essential to adhere to a "balanced policy" between different political actors, Iran's participation in this project was considered as a strategic step of the Azerbaijani government to get Tehran's support.[19] However, the US government showed its apparent unwillingness concerning Iran's participation in the project. Azerbaijan refused Iran to participate in the "Contract of the Century." Nevertheless, Iran later got its share in the development of the SD natural gas field.[20]

5.1.2 Russia as the primary opponent of the singing of "the Contract of the Century"

The Russian Ministry of Foreign Affairs said Russia is not interested in being a part of this deal. As a reason for this decision, it was named the unclear legal status of the Caspian Sea. Despite such a negative view of the "Contract of the Century" by the Kremlin, Russia's largest energy company, "Lukoil" Oil Company, took part in the energy deal.[21] The Ministry of Foreign Affairs of the RF commented on the signing of the "Contract of the Century":[22]

> "Recently, Azerbaijan, Kazakhstan, and Turkmenistan make persistent attempts to conclude contracts with Western corporations to develop the bottom of the Caspian Sea. Besides, Azerbaijan and Turkmenistan have adopted the acts directed to the assignment of large Caspian spaces. The specified actions are incompatible with the operating legal status and restrain Russia's rights and interests."

After signing the energy agreement, Azerbaijani President H. Aliyev visited Russia on 17 November 1994. Meetings occurred between the Russian and Azerbaijani presidents and the Prime Minister of Russia, V. Chernomyrdin. The discussion's central topic was the peaceful negotiation of the Nagorno-Karabakh conflict between Azer-

18 Rovshan, I. (2011). Energy resource transportation by countries with no access to the open sea (an Azerbaijan case study). The Caucasus & Globalization, 5(1-2).

19 Bagirov, S. (2001). 10. Azerbaijan's strategic choice in the Caspian region.

20 De Waal (2018).

21 Smirnov A. (September 24, 1994). Bolshe nefti-xoroshey i raznoy [More oil – good and different one], Retrieved April 27, 2023, from Commersant newspaper, https://www.kommersant.ru/doc/90649

22 Kak razdelit kaspiyskuyu neft? [How to share the Caspian oil?]. (n.d.). Retrieved April 27, 2023, from http://web.archive.org/web/20200129200055/http://caspiy.net/dir3/west/4.html

baijan and Armenia and the newly signed energy contract discussed vigorously between both states' delegations.[23]

A journalist of Commersant newspaper, one of Russia's very famous newspapers, wrote concerning this issue the following:[24]

> "…there is nothing for Baku to worry about, and in this situation, the Russian Ministry of Foreign Affairs notes can just be ignored. And internationalization of the Caspian contract, which Azerbaijan managed to achieve, makes its position stronger". In this situation, Russia has to accept the new political constellation in this region that was created after the singing of "the Contract of the Century."

After the signing of the energy deal, a central problem was the transport issues for exporting Azerbaijani oil to the world energy market. There were two possible transport corridors: through Russia and Turkey. The second transport plan was a priority not only for the Azerbaijani government but also for the Western countries which were interested in constructing the pipeline. Moreover, the White House was looking for options to put an end to a Russian transport monopoly. Therefore, Turkey's transport corridor might have created an excellent possibility to decrease the region's energy transport dependence on Russia.[25]

5.1.3 Significance, positive and negative aspects

Since Azerbaijan was in a highly chaotic political situation in the first years of its independence and Azerbaijan's statehood and independence were under threat, the most significant benefit of the international energy agreement with the Western countries and energy companies became the reinforcement of the freedom of the Azerbaijan Republic. Therefore, the Azerbaijani government agreed to have a relatively modest share of oil production from the ACG oil fields to preserve its sovereignty.[26]

A temporary neutralization of Russia and its hegemonic role in the South Caucasus is another critical factor, considered the next significant aspect of the energy deal. Russia had been the region's mightiest political actor before the energy con-

23 Kommersant.ru. (November 19, 1994). Itoqi vizita v Moskvu Qeydara Aliyeva [Results of Heydar Aliyev's visit to Moscow]. Retrieved April 27, 2023, from https://www.kommersant.ru/doc/95587

24 Kommersant.ru. (November 19, 1994).

25 Ibrahimov, R. Azerbaijan Oil Production as a Main Locomotive of State Economy.

26 Nassibli, N. (1999). Azerbaijan's geopolitics and oil pipeline issue. Perceptions: Journal of International Affairs, 4(4).

tract's signing. However, international political actors such as the USA,[27] the EU, Turkey, and Israel also started playing an active role in the region's political life after the realization of the energy deal.[28] Additionally, this project stimulated the realization of some other significant projects such as PfP, the Silk Road Strategy Act, etc.[29]

The USA's active participation in the new political constellation of the South Caucasus became a significant factor in this region's economic and political development. According to Svante Cornell,[30] there were three main factors from the perspective of the White House to support the "Contract of the Century":[31]

- The significant role of the energy sector in reinforcing the independence of the South Caucasian states;
- US corporate interests in the region;
- The importance of the energy reserves of the Caspian Sea for the world energy market.

Moreover, "the deal of the Century" led to more significant connections between Azerbaijan and Western companies' oil industry. The oil industry became an essential part of Azerbaijan, and the country got a chance to have access to the world energy market thanks to this agreement. In their turn, the Western investors gained access to Azerbaijan's energy market that promoted the energy sector's development. They stimulated the realization of other significant oil and natural gas projects in the future.[32]

The positive aspects of the realization of the "Contract of the Century" for the newly independent country[33] should be summarized with the following points:[34]

- Definition of the geostrategic Westernized political course;
- Minimization of Russia's influence;

27 Cornell, S. (2005). US engagement in the Caucasus: Changing gears. Helsinki Monitor, 16(2), 111–119. 848 Murinson, A. (2008). Azerbaijan–Turkey–Israel Relations: The Energy Factor. Middle East Review of International Affairs, 12(3), 47–64.

28 Khalifa-Zadeh, M. (2014). The South Caucasus: Obama's Failed Russia 'Reset' and the Putin Doctrine in Practice. MERIA Journal, 18(3).

29 Ibid.

30 A Swedish political expert, who studies the politics and security issues of Eurasia. He is the author of some books like: "Small Nations and Great Powers: a Study of Ethnopolitical Conflict in the Caucasus," "Azerbaijan since Independence."

31 Cornell (2005).

32 Prezident.az. http://web.archive.org/web/20210403003907/https://en.president.az/azerbaijan/contract

33 Ibrahimov, R. (2014). US-Azerbaijan Relations: A View from Baku. Rethink Paper, 17.

34 Cornell (2005).

- Access to the world oil industry;
- Significant economic dividend;
- Excellent opportunity for the development of the non-oil sector.

There are some main negative aspects of the first largest energy deal of the Caspian Region alongside some positive effects of the agreement:

- *It postponed the definition of the Nagorno-Karabakh's problem's regulation* on relatively unwanted political conditions for Azerbaijan. Since Azerbaijan became an attractive energy country for the political actors and some energy companies, key political actors did not pay needed attention to change the existing "status quo" to achieve desired progress in this conflict's peaceful regulation.[35] Therefore, the contract's signing led to postponing the Nagorno-Karabakh conflict's regulation for an uncertain time.[36]
- *The frustration of Azerbaijani citizens*. The expected " Kuwaitisation" of Azerbaijan did not happen because of crucial negative factors like the large-scale corruption, stagnation, and monopolism in different spheres of the society and unfair and non-transparent distribution of income are just some of them.[37] Therefore, the immense influx of oil money to the country's budget did not bring expected economic prosperity to Azerbaijan.[38] Conversely, Azerbaijani oligarchs and western energy companies could profit from this energy deal enormously.[39]
- *An extreme increase in oil dependence of Azerbaijan*. From the moment of the singing of the "Contract of the Century," the Azerbaijani economy started developing in a "one-sided" way. Since the Azerbaijani government and people accepted oil export as the only possible solution to the economic problems, other non-energy sectors were not developed appropriately. Therefore, the Azerbaijani economy became more dependent on "oil money." It is unclear whether other spheres of the Azerbaijani economy will achieve the oil sector's progress tempo any time soon because of easy "oil money" coming to the country's budget from energy deals, including the "Contract of the Century."

35 Souleimanov, E., & Evoyan, L. (2012). Two Position on the Nagorno Karabakh war: Russian and Turkish (1990-1994). Central Asia and the Caucasus: Journal of Social and Political Studies, 13(4).

36 Özkan, B. (2008). Who gains from the "no war no peace" situation? A critical analysis of the Nagorno-Karabakh conflict. Geopolitics, 13(3), 572–599.

37 Rasizade, A. (2002). Azerbaijan after a decade of independence: less oil, more graft and poverty. Central Asian Survey, 21(4), 349-370.

38 Öge, K. (2015). Geopolitics and revenue transparency in Turkmenistan and Azerbaijan. Eurasian Geography and Economics, 56(1), 89–110.

39 O'lear, S. (2007). Azerbaijan's resource wealth: political legitimacy and public opinion. Geographical journal, 173(3), 207–223.

5.2 Shah Deniz natural gas project Stage-1

Shah Deniz, translated from Azerbaijani, means "the King of the Sea." It is the largest natural gas field in the Republic and one of the Caspian Region's biggest. The SD gas field is nearly 860 km^2 and occupies more than 140 km^2. The pool of the field is almost the same size and shape as Manhattan Island. The natural gas reserves of this shelf are calculated between 1.5 bn. (240,000,000 m^3) 3 bn. barrels (480,000,000 m^3).[40]

The SD field is located in the southern part of Baku and is nearly 70 km away from Azerbaijan's capital city (see Map 11). The area is located in the Caspian Sea's deep water and was discovered by Azerbaijani geologists in 1999. The depth of the natural gas field varies between 50 to 500 m.[41] The primary source for collecting, processing, and exporting natural gas from SD is the Sangachal terminal, located nearly 55km south of Baku.[42]

After discovering the oil field, international companies were interested in developing it. The agreement between the Azerbaijani government and foreign enterprises to develop the area became the second large-scale contract for the Azerbaijani Republic after independence.

The signing ceremony of the agreement was organized in Baku on 4 June 1996, and significant international energy enterprises such as BP, Statoil, SOCAR, NIOC, Total, and TPAO took part. According to the agreement's conditions, BP and Statoil took 25,5% of the shares, SOCAR, Lukoil, NICO and Total 10%, and TPAO 9%, respectively.[43] BP was initially confirmed in the role of the project operator on behalf of the other PSA partners.[44] The ratification of the SD agreement by the Azerbaijani parliament took place exactly four months later, on 4 October 1996.[45]

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40 Valve-world.net. (December 2014). Emerson to automate BP-operated Shah Deniz Stage 2 operations in Azerbaijan. Retrieved April 27, 2023, from https://www.valveworld.net/pdf/project_report_shah_deniz_platform.pdf

41 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay. Retrieved April 27, 2023, from http://web.archive.org/web/20210307221213/https://www.bp.com/en_az/azerbaijan/home/who-we-are/operationsprojects/shaheniz.html

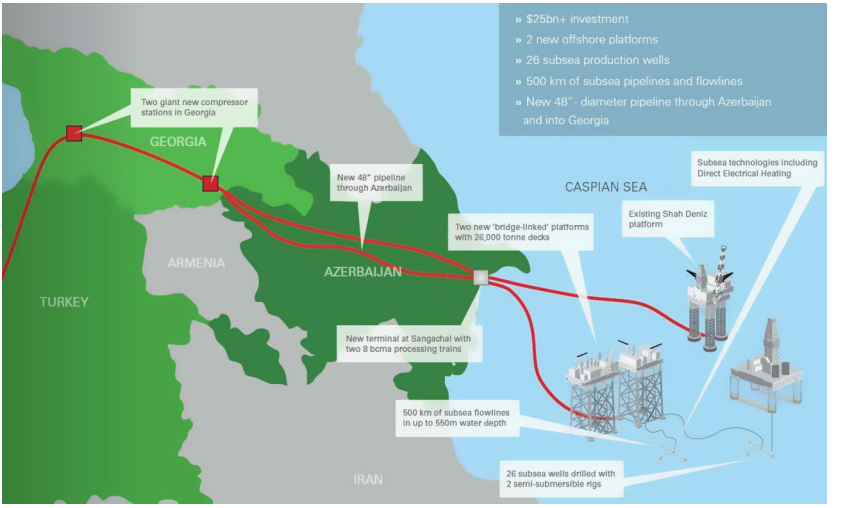
42 Iskandarov, K., Mahammadali, V. M., & Gardashkhan, A. G. (2020). Caspian Region: Geopolitical Arena. Clash of Interests and Energy Security. Civitas et Lex, 26(2), 7–22.

43 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

44 Ebrd.com. (n.d.). Shah Deniz gas export Project Stage 1 Development Environmental & Socio-economic Impact Assessment. Retrieved April 27, 2023, from http://web.archive.org/web/20161020010821/http://www.ebrd.com/english/pages/project/eia/shahdeni.pdf

45 Unece.org. April 27, 2023, from https://unece.org/dam/env/documents/2019/ece/restart/azerbaijan/azerbaijan-response.pdf

Map 11: Shah Deniz Contract Area[46]



The exploration of the SDX-1, SDX-2, and SDX-3 wells started in 1999.[47] The first well drilling proved that the field was rich in natural gas reserves.[48] The second well drilling estimated the real potential of the SD.[49] However, the drilling of the SDX-3 did not bring desirable results. In contrast to the positive expectations, SDX-3 did not contain any amount of natural gas.

The negotiations between the Azerbaijani government and potential members of the project began only in 1999. Despite the fact that the exploration of the SD field started in 1999, the implementation of some essential issues like drilling, the building of platforms, and the building of an onshore terminal was done only after seven years.

Therefore, two binding agreements concerning natural gas extraction from SD in 2001 were signed. The first agreement, the so-called "Intergovernmental Agreement and a Sale and Purchase Agreement," was signed with Turkey in Ankara on 12

46 https://www.minenergy.gov.az

47 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

48 Azakov, S. I. (2018, December). Contribution of Azerbaijan to the energy security of the European Union. In IOP Conference Series: Materials Science and Engineering (Vol. 459, No. 1, p. 012011). IOP Publishing.

49 Offshore-mag.com. (April 1, 2000). Shah Deniz's potential provides hope for other Caspian Sea operators. Retrieved April 27, 2023, from https://www.offshore-mag.com/business-briefs/equipment-engineering/article/16763348/shah-denizs-potential-provides-hope-for-other-caspian-sea-operators

March 2001.[50] According to this contract, the countries agreed to supply natural gas from the SD natural gas field to Turkey.[51] Consequently, due to the signed agreement between the Azerbaijani SOCAR and the Turkish BOTASH, Azerbaijan undertook to supply Turkey 6.6 bcm/a natural gas.[52] The next deal was signed between the Azerbaijani and the Georgian governments on"Intergovernmental Agreement and Related Accords for the Transit, Transportation, and Sale of Natural Gas" on 29 September of the same year. The signing of the contract documents was realized by the presence of the presidents of Azerbaijan and Georgia.[53]

Two final-stage agreements were signed, which significantly accelerated the project's implementation. A so-called "Host Government Agreement" between Azerbaijan and the member energy companies of the project concerning transit, transportation, and natural gas supply from SD 1 was reached in February 2001. The agreement with the same content on transit, transportation, and sale of natural gas, marking the transition into the final stage of engineering, tendering, and commercial development work, was signed between Georgia and SD member companies on 14 March of the same year.[54]

In 2005–2006 a gasket SCP was built between Sangachal terminal and Erzurum, Turkey, for transporting natural gas from the SD field. The length of the gasket reached about 690 km.[55] The construction of the entire part of the SD gas project was finished by 2006. Therefore, production started in 2006. The field has a producing capacity of nearly 10 bcm/a of natural gas and around 50,000 b/d of condensate.[56]

However, transport from the SD 1 started three months later than it was initially planned. The delay was caused because of technical problems in the natural gas field. For this reason, the Azerbaijani government announced the shutdown of the first

50 Intergovernmental Agreements and Host Government Agreements on Oil and Gas Pipelines. A Comparison. (2015). Retrieved April 27, 20213, from http://web.archive.org/web/20170909132434/http://www.energycharter.org/fileadmin/documentsmedia/legal/agreements_on_oil_and_gas_pipelines.pdf

51 BBC.co.uk. (March 12. 2001). Caspian gas deal signed. Retrieved April 27, 2023, from http://web.archive.org/web/20200218055259/http://news.bbc.co.uk/2/hi/europe/1217151.stm

52 Cohen, G. (July 2019). Natural gas import and export routes in South-East Europe and Turkey. Workingpaper, No26.

53 Jamestown.org. (October 3, 2001). Agreements on Shah-Deniz Gas Transit Signed. Retrieved April 27, 2023, from http://web.archive.org/web/20210227194954/https://jamestown.org/program/agreements-on-shah-deniz-gas-transit-signed/

54 Intergovernmental Agreements and Host Government Agreements on Oil and Gas Pipelines. A Comparison. (2015).

55 BP.com. (December 15, 2006). Production begins at Shah Deniz gas condensate field in the Caspian Sea. Retrieved April 27, 2023, from http://web.archive.org/web/20201023214734if_/https://www.bp.com/en_az/azerbaijan/home/news/press-releases/production-begins-at-shah-deniz-gas-condensate-field-in-the-casp.html

56 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

stage of the SD field for a few weeks.[57] However, natural gas production was renewed by July 2007. The export to Turkey was restarted on 4 July 2007.[58]

5.2.1 Azerbaijan's economic profit

Azerbaijani officials announced in 2013 that Azerbaijan would not take any significant revenues from the SD 1 natural gas field for the following years. Consequently, the Deputy Minister of Finance of the Republic of Azerbaijan, Azer Bayramov, on 11 December 2013, stressed that Azerbaijan would get no revenue from the SD 1 in the next four years. He named the tremendous expenditure that Azerbaijan had to invest in developing and implementing the SD 2 field as the main reason. Consequently, the investment into SD 2 was calculated up to $60 bn.[59]

The total investment from 2003 to 2013 was calculated as $8.224 bn.[60] Considering that this was the first natural gas project of Azerbaijan, the Azerbaijani government and citizens had high expectations that this energy project could have a significant influence on natural gas extracted from the SD field constituted $66 million in 2020.[61] For comparison, Azerbaijan made economic gains of around $189.5 million in the first part of 2015.[62]

The entire economic profit of the SOFAZ from SD 1 from the day of its realization to May 2016 amounted to $2.506 bn. The modest income from the SD 1 was invested in the construction and development of the SD 2 project,[63] which supplies natural gas from the field to Europe. The Ministry of Energy of the Republic of Azerbaijan

57 Valve-world.net. (December 2014).

58 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

59 Haqqin.az. (December 12, 2013). I. Shaban: Zamministra Azer Bayramov prav-deneq ot prodaji qaza ne budet [The Deputy Minister Azer Bayramov is right – there will be no money from the sale of gas]. Retrieved April 27, 2023, from http://web.archive.org/web/20131215034045/http://haqqin.az/news/14182

60 Naturalgaseurope.com. (November 19, 2014). Total investment in Shah Deniz gas field at $11.4 billion. Retrieved April 27, 2023 from https://www.naturalgaseurope.com/shah-deniz-gas-field-investments-profit

61 Azernews.az. (June 3, 2020). State Oil Fund announces revenues from ACG, Shah Deniz fields. Retrieved April 28, 2023, from http://web.archive.org/web/20200928220736/https://www.azernews.az/oil_and_gas/165701.html

62 Haqqin.az. (August 18, 2015). Pribil Azerbaydjana v Shah Deniz snizilas na tret [The profit of Azerbaijan in Shah Deniz has decreased on a third]. Retrieved April 27, 2023, from http://web.archive.org/web/20150820214442/http://haqqin.az/news/51191

63 Haqqin.az. (December 12, 2013).

states that it was extracted 12.3 bcm of natural gas from SD between January-August 2020.[64]

BP states that the field's production capacity is over 56 mcm/d or over 20 bcm/a of natural gas. From the day of the first extraction until the end of 2018, it has produced more than 100 bcm of natural gas.[65] SOFAZ garnered 534.7 million manat ($314.5 million) in revenue from the Shah Deniz field's gas and condensate sales, with condensate sales specifically contributing 58 million manat ($34 million).[66]

5.3 Shah Deniz Stage-2

SD 2 is the second stage of the natural gas field explored in the Azerbaijani part of the Caspian Sea. The SD 2 area is one of the world's most significant natural gas fields. It plays a considerable role in ensuring the energy security of Europe by transporting natural gas from Azerbaijan to the energy market of Europe.[67] The total expenditure for its realization is calculated to be up to $45 bn.[68]

The first stage's capacity is estimated at nearly 1,2 tcm, and its production capacity equals 9 bcm/a.[69] However, it is expected that the extraction from the second stage will increase the total capacity of the field for an extra 16 bcm/a and condensate capacity for 120,000 b/d.[70] An agreement was signed that entails an export of 10 bcm natural gas to Europe. It implies the export of 1 bcm of natural gas to Bulgaria and Greece and the rest to Italy.[71]

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64 Minenergy.gov.az. (September 22, 2020). Gas production increased over the eight months. Retrieved April 27, 2023, from https://minenergy.gov.az/en/xeberler-arxivi/bu-ilin-sekkiz-ayinda-qaz-hasilati-artib

65 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

66 Trend.az. (March 5). Retrieved March 12, 2024, from Azerbaijani Sofaz airs its earnings from Shah Deniz field for 2M2024. https://en.trend.az/business/energy/3870288.html

67 BP.com. Shah Deniz Stage 2, Azerbaijan. (2018, June 30). Retrieved April 27, 2023, from http://web.archive.org/web/20210127165757/https://www.bp.com/en/global/corporate/investors/upstream-major-projects/major-projects-2018/shah-deniz-stage-2.htm

68 Emerson.com. (n.d.). Emerson to Automate BP-Operated Shah Deniz Stage 2 Operations in Azerbaijan. Retrieved April 27, 2023, from https://www.emerson.com/en-gb/news/corporate/shah-deniz-stage-2-operations

69 BP.com. (April 16, 2012). Shah Deniz stage 2 project enters the next phase of development. Retrieved April 28, 2023, from https://www.bp.com/en/global/corporate/news-and-insights/press-releases/shah-deniz-stage-project-enters-the-next-phase-of-development.html

70 Offshore-technology.com. (n.d.). Shah Deniz Stage Two, Caspian Sea. Retrieved April 28, 2023, from https://www.offshore-technology.com/projects/shah-deniz-stage-2-caspian-sea/

71 Pirani, S. (2018). Let's not exaggerate–Southern Gas Corridor prospects to 2030.

The implementation process of the field began still in December 2007. Nevertheless, the construction of the project's second stage started in April 2012. The last amount of capital invested in its development was announced in December 2013.[72] The long negotiations between energy enterprises and the lack of sufficient infrastructure for the export of the natural gas reserves caused the delay of its realization.

For the realization of the project, nearly 28$ bn was needed, according to BP's announcement in 2013, while exactly 28$ bn. the investment was spent on exporting natural gas from the SD field to the Georgian-Turkish border.[73]

The modern concept of the SD 2 contains the following processes:[74]

- Drilling of 26 wells functioning underwater;
- Building two new platforms;
- Underwater pipelines for the gas and condensate;
- Expansion of the Sangachal terminal;
- The construction of two gas-compressor stations.

The extracted natural gas from the SD field is delivered via a 3500 km long SGC pipeline. The SGC pipeline route system is one of the significant and expensive pipeline systems of the region and involves three essential projects to export gas to Europe.[75]

The SGC consists of the following projects:

a) South Caucasus Pipeline (SCP), which is expected to be extended through a newly constructed parallel pipeline across Azerbaijan and Georgia.
b) Trans Anatolian Pipeline (TANAP) that supplies from the SD extracted natural gas across Turkey.
c) The final stage, the so-called Trans Adriatic Pipeline (TAP), was constructed to transport the gas from Greece and Albania to Italy.

72 Offshore-technology.com, https://www.offshore-technology.com/projects/shah-deniz-stage-2-caspian-sea/

73 BP.com. (December 17, 2013). Shah Deniz investment decision paves way for Southern Corridor gas link. Retrieved April 28, 2023, from http://web.archive.org/web/20210119051926/https://www.bp.com/en/global/corporate/news-and-insights/press-releases/shah-deniz-final-investment-decision-paves-way.html

74 BP.com. Shah Deniz investment decision paves way for Southern Corridor gas link.

75 Offshore-energy.biz. Shah Deniz Stage 2 well underway. (August 14, 2015). Retrieved April 28, 2023, from https://www.offshore-energy.biz/video-shah-deniz-stage-2-well-underway/

5.3.1 Shareholders and agreements concerning the implementation

The negotiations around the SD gas field's second stage began in early 2008. The talks' main issue became the discussions around transport channels' definition to export the additional gas volume from the SD 2 to the European energy market.[76] The ceremony of the so-called Final Investment Decision (FID) took place in Azerbaijan's capital on 17 December 2013 after five years of continued and lively negotiations.[77]

The international energy companies: BP, SOCAR, TPAO, Petronas, Lukoil, and NICO became the member enterprises of the projectSome changes in the shares of the member companies have appeared since the signing of the agreement. Consequently, the Russian energy company LUKOIL bought 5% of Eni's shares in June 2004. Further, BP and SOCAR purchased the shares of Statoil in December 2013. Thus, BP and SOCAR acquired an extra 3.3% and 6.7%, respectively.[78] Moreover, Total SA sold its 10% share to Turkish TPAO in May 2014.[79]

According to the main shareholder and operator of the SD field BP, some essential agreements concerning the second stage's development have already been signed. The total value of the contracts equals more than $13 bn., reported Trend agency.[80]

The first contract, which includes the construction and commissioning of the SD 2, has been granted to Tekfen-Azfen Consortium. The worth of this agreement is estimated at around $998 million. The work started in January 2014.[81]

The work of the consortium includes some functions such as:[82]

76 Fackrell, B. (2013). Turkey and regional energy security on the road to 2023. Turkish Policy Quarterly, 12(2), 83-89.

77 Fackrell, B. E. (2013). Current Developments in Regional Energy Security and Turkey. Insight Turkey, 15(1).

78 Amirova-Mammadova, S. (2018). New Geopolitics of the Southern Gas Corridor. In Pipeline Politics and Natural Gas Supply from Azerbaijan to Europe (pp. 159-190). Springer VS, Wiesbaden.

79 Soltanov, E. (2011). South East Europe Pipeline: Greater Benefit for a Greater Number of Actors. Istituto Affari Internazionali (IAI).

80 Pomfret, R. (2012). Oil and power in the Caspian Region. Handbook of oil politics, 191–205.

81 Jamestown.org. (January 14, 2014). Shah Deniz Investment Decision Validates Commercial Agreements, Triggers Construction Contracts. Retrieved April 10, 2023, from http://web.archive.org/web/20210221083530/https://jamestown.org/program/shah-deniz-investment-decision-validates-commercial-agreements-triggers-construction-contracts/

82 BP.com. (December 19, 2013). Shah Deniz begins to award Stage 2 contracts. Retrieved April 28, 2023, from https://www.bp.com/en_az/azerbaijan/home/news/press-releases/shah-deniz-begins-to-award-stage-2-contracts.html

- Construction of the foremost gas and condensate processing facilities at the Sangachal terminal;
- Gas, condensate, and MEG pipeline installation from the offshore pipeline beach landing site to the terminal facilities;
- Brownfield works in the existing Sangachal Terminal

The second agreement of the SD 2 spans some essential processes like fabrication, load out and offshore hook-up, and commissioning of the top sides' units of the SD 2 platforms – Production and Risers platform (SDB-PR) and Shah Deniz Bravo, Quarters and Utilities (SDB-QU) platform was granted to the AMEC Tekfen Azfen (ATA) in December 2013.[83] The deal is worth about $974 million. This contract started to function in January 2014.[84]

Exploration Development and Production Sharing Agreement (EDPSA) was awarded to the consortiums by the Azerbaijani Republic. The awarded consortiums became an appropriate right to investigate and produce natural gas from the SD field. EDPSA provides:[85]

- Definition of the SD exploration area;
- Investment and work commitment scope;
- Application of the taxation principles;
- Involvement of the State in decision-making;
- Costs, which the Contractor Parties may recover against petroleum production and the profit-sharing formula.

5.3.2 Development during last years and expectations

According to BP, the project's primary operator, the first part of 2020 was relatively productive in developing the SD field. It was extracted nearly 4.7 bcm of natural gas and 1 mt (7.7 mb) of condensate from the Shah Deniz Alpha and Shah Deniz Bravo platforms.[86] For comparison, 5.2 bcm of gas and 1.2 mt of condensate were obtained in 2015. The expenditure for the development of the field in the first part of 2016

83 Ibid.

84 Patnaik, R. (January 29, 2014). AMEC Wins US$974 Million Service Contract for Shah Deniz II Gas Field, Oil Review Middle East, https://www.oilreviewmiddleeast.com/gas/amec-bags-us-974-million-service-contract-for-gas-field-in-caspian-sea

85 Rzayeva, G. (2015). The Outlook for Azerbaijani Gas Supplies to Europe: Challenges and Perspectives.

86 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

reached $225 million, while significant amounts of money were invested, especially in the development of SD2.[87]

In general, BP estimated 2016 as one of the most fruitful years in developing the SD 2 stage. More than 89% of works concerning the critical stages, such as engineering, procurement, and construction of the SD 2 natural gas project were accomplished, particularly in this year. Over 24000 people were involved in developing the Azerbaijani part of the project, and more than 80% of workers were Azerbaijani citizens.[88]

According to the report of the project's primary operator, 2017 was the most successful year in developing the field. Thus, it accomplished more than 92% of the implementation regarding engineering, procurement, and construction by 2017.[89] BP states that it was produced over 121 bcm of gas and 28 mt of condensate since the beginning of the production. Moreover, the installation of subsea activities via the Khankendi vessel went on in the first quarter of 2020.[90]It was estimated that after the start of the natural gas output from SD 2, the volume of extracted and exported natural gas would grow significantly.[91]

Therefore, if the first stage's shipping capacity was 10 bcm/a, while the second stage's export capacity is estimated at 16 bcm/a, the total export potential of the field should reach up to 26 bcm/a. At the beginning of 2021, Azerbaijan started its direct natural gas supply to the European natural gas market for the first time in its history.[92]

Azerbaijan invested significant capital in the realization of the project. However, it needed an extra essential amount of investment to continue constructing other parts, so the Azerbaijani economy has experienced some challenges with further in-

87 Teknoblog.ru. (August 22, 2016). Britanskaya BP narashivaet dobichu qaza v Azerbaydjane [The British BP increases gas production in Azerbaijan]. Retrieved April 28, 2023, from h ttps://teknoblog.ru/2016/08/22/67509

88 Azernews.az. (August 17, 2017). BP: Shah Deniz Stage 2 project over 95pct complete. Retrieved April 28, 2023, from http://web.archive.org/web/20180922165504/https://www.azernews.az/oil_and_gas/117753.html

89 BP.com. (n.d.). Shah Deniz has been and still is BP's largest discovery since Prudhoe Bay.

90 BP.com. (n.d.). Business Update 1 st quarter 2020 results. Retrieved April 28, 2023, from https://www.bp.com/content/dam/bp/country-sites/en_az/azerbaijan/home/pdfs/business-updates/1q_2020_results-eng.pdf

91 Abc.az. (November 4, 2015). Pik dobichi qaza s mestorojdeniya Shah-Deniz budet dostiqnut in 2020 [The gas production peak from the field Shah-Denise will be reached in 2020]. Retrieved April 28, 2023, from http://web.archive.org/web/20160406204844/http://abc.az/rus/news/91931.html

92 Offshore-energy.biz. (January 4, 2021). Azerbaijan sends first gas export via TAP pipeline. Retrieved April 28, 2023, from http://web.archive.org/web/20210113200043/https://www.offshore-energy.biz/azerbaijan-sends-first-gas-export-via-tap-pipeline/

vestment because of the low prices of energy resources in the world energy market. Consequently, the profit from SD 1 was being used for the implementation of SD 2.[93]

Azerbaijan's economy has already suffered significantly from the "turbulence of oil prices," which has been considered since 2014. For this reason, the national currency of Azerbaijan lost half of its value and became the world's worst-performing currency in 2015.[94]

Since an essential part of the profit from the project will be used on the settlement of the expenses,[95] consequently, it is relatively challenging to anticipate whether the implementation of this expensive project brings expected substantial financial dividends to the Azerbaijani budget.

5.4 South Caucasus Pipeline

SCP, which was endorsed for the construction and operation in February 2003, is a critical phase of the first stage of the SD natural gas field. The project's development started in 2004 and was accomplished two years later, in the second part of 2006. It was invested nearly $1 bn. in constructing the entire project. The whole length of the pipeline is 691 km,[96] and its operation life was planned for up to 30 years.[97] According to BP, the operating costs constituted $47 million, while the capital costs were $13 million in 2020.[98] The primary purpose of SCP's design, which is well-known with its definition BTE pipeline, is the export of natural gas from Azerbaijan to Georgia and Turkey. The natural gas export starts in the Sangachal terminal in Azerbaijan, and

93 Offshore-technology.com. (August 14, 2016). Shah Deniz: The ace up Azerbaijan's sleeve. Retrieved April 28, 2023, from http://web.archive.org/web/20170705041412/http://www.offshore-technology.com/features/featureshah-deniz-the-ace-up-azerbaijans-sleeve-4978356/

94 FT.com. (December 21, 2015). Azerbaijani manat collapses after government abandons dollar peg. Retrieved April 28, 2023, from http://web.archive.org/web/20210108164259/https://www.ft.com/content/b5f46eac-a7c4-11e5-9700-2b669a5aeb83

95 Haqqin.az. (December 12, 2013).

96 443 km of the whole length of the pipe is located in Azerbaijan and 248 km in Georgia.

97 Hydrocarbons-technology.com. (n.d.). South Caucasus Pipeline (SCP), Georgia, Turkey, Azerbaijan. Retrieved April 28, 2023, from http://web.archive.org/web/20201001010226/https://www.hydrocarbons-technology.com/projects/south-caucasus-pipeline-scp-georgia-turkey-azerbaijan/

98 BP.com. (February 4, 2021). 2020 full year results. Retrieved April 28, 2023, from http://web.archive.org/web/20210204075538if_/https://www.bp.com/en_az/azerbaijan/home/news/business-updates/2020-full-year-results.html

it is exported via the SCP,[99] while the pipeline adjoins the Turkish gas distribution system in Turkey, namely to the domestic supply grid at Erzurum.[100]

Only one company, the South Caucasus Pipeline Company (SCPC), is obligated to build and operate the SCP pipeline system. Therefore, if BP has a technical operator function and is obliged to care about some critical issues, such as the construction and operation of the SCP facilities, SOCAR Midstream Operations Limited executes the project's business administration function.[101]

The original construction reason for the expansion of the SCP intends to prolong the SCP System's total length to deliver an additional amount of natural gas extracted from the SD 2 natural gas field to Georgia, Turkey, and further to Europe (see Map 12). The expansion of the SCP includes laying new pipelines in the Azerbaijan territory and building two new compressor stations in Georgia to increase the amount of exported natural gas three times. Consequently, the SCP expansion will increase the volume of exported natural gas up to 20 bcm/a.[102]

A 48-inch pipeline loop was built to accommodate other 16 bcm/a gas alongside the originally constructed SCP. The extension of the pipeline causes some additional vital facilities besides the construction of a 48-inch pipeline loop that is necessary to accomplish an extension of SCP:[103]

- Two new compressor stations in Georgia;
- Comprise two new compressor stations, one in Azerbaijan and another one in Georgia;
- Six 48-inch block valve stations, five in Azerbaijan and one in Georgia;
- Pressure reduction and metering stations at the international borders;
- Interconnection with TANAP at the Georgia-Turkey border.

It was initially intended to create a pipeline connection between SCP and TANAP in Eastern Turkey through the SCP extension. The construction of TANAP, which

99 BP.com. (2020). Sangachal terminal. Retrieved April 28, 2023, from http://web.archive.org/web/20210119043826if_/https://www.bp.com/en_az/azerbaijan/home/who-we-are/operationsprojects/terminals/sangachal_terminal.html

100 BP.com. (2020). BP history in Georgia. Retrieved April 28, 2023, from http://web.archive.org/web/20201130082609if_/https://www.bp.com/en_ge/georgia/home/who-we-are/history.html

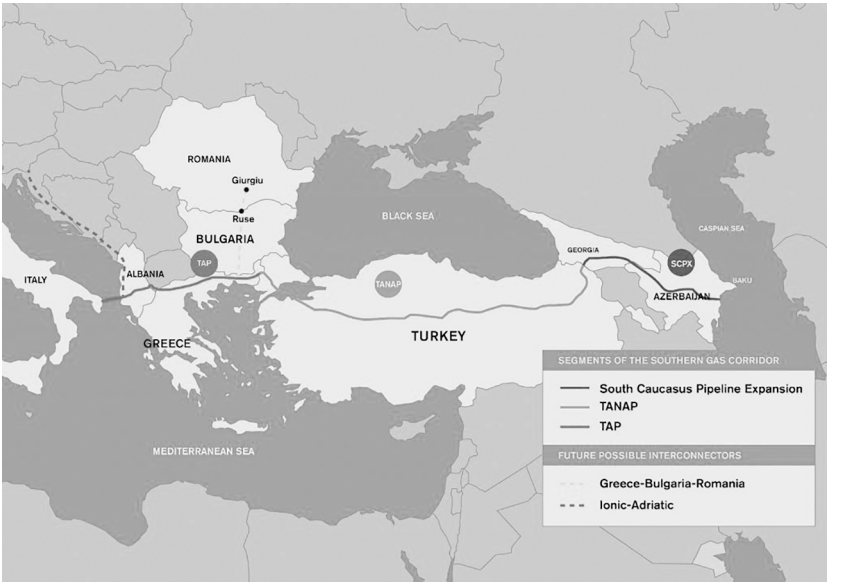
101 BP.com. (2020). South Caucasus Pipeline Project. Retrieved April 28, 2023, from http://web.archive.org/web/20200428091227/https://www.bp.com/en_ge/georgia/home/who-we-are/scp.html

102 BP.com. South Caucasus Pipeline Project.

103 BP.com. (2020). BP history in Georgia.

connects with TAP, was officially started in March 2015.[104] In its turn, TAP exports natural gas extracted from the SD to Greece, Albania, and under the Adriatic Sea to the Southern part of Italy. The entire length of TAP is about 1900 km, while its range reaches 870 km.[105]

Map 12: SCP expansion[106]



5.5 TANAP

TANAP is a critical lot of the entire SGC project. It is a pathbreaking pipeline that exports natural gas from the Azerbaijani part of the Caspian Sea to the energy market of Europe for the first time in the energy industry of Azerbaijan.

The entire amount of TANAP transported natural gas will reach 16 bcm/a. It was initially planned to supply 6 bcm/a to Turkey and 10 bcm/a from 16 bcm/a to the Eu-

104 Oilandgas360.com. (October 14, 2015). New pipeline will triple Azerbaijan's natgas piped to Europe, avoiding Russia. Retrieved April 28, 2023, from http://web.archive.org/web/20190806050832/https://www.oilandgas360.com/new-pipeline-will-triple-azerbaijans-natgas-piped-to-europe-avoiding-russia/

105 BP.com. (2020). BP history in Georgia.

106 https://www.offshoreenergytoday.com

ropean energy market.[107] The construction of the project was expected to be finished by the end of 2018.[108] The first export volume should have been supplied to Turkey by late 2018 and the EU in 2019. However, some reasons delayed the transport. Azerbaijan exported its first natural gas volume to the European energy market in early 2021.

TANAP starts in the Turkish village of Türkgözü, namely in the Posof district of Ardahan. The pipe further goes through 20 provinces: Kars, Erzurum, Erzincan, Bayburt, Gümüşhane, Giresun, Sivas, Yozgat, Kırşehir, Kırıkkale, Ankara, Eskişehir, Bilecik, Kütahya, Bursa, Balıkesir, Çanakkale, Tekirdağ, and Edirne (see Map 13) and connects with another pipeline. Consequently, the last point of TANAP is Edirne city, where TANAP connects with TAP, which exports natural gas through Albania and an offshore zone in the Adriatic Sea to Italy.[109]

An agreement was reached between the TAP and the TANAP consortiums about a partnership and cooperation between the consortiums on 22 November 2012. The signed Memorandum of Understanding and Cooperation between the two companies spans some vital aspects such as technical and commercial framework, the organization of cooperative activities, and the creation of a platform for the information exchange between TANAP and TAP.[110]

There are two off-take stations on Turkey's territory, which are used to transfer natural gas further. One of them was constructed in Eskisehir city. Another one is in Thrace. TANAP's length is about 1850 km and is one of the longest pipelines in the world, built 19 km under the Marmara Sea.[111] It is also one of the crucial natural gas pipeline routes for Turkey's energy industry. TANAP includes some fundamental technical stuff:[112]

- Seven compressor stations;
- Four measuring stations;
- 11 pigging stations;

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107 Caspianbarrel.org. (April 24, 2015). BP becomes shareholder of TANAP project. Retrieved April 28, 2023, from http://caspianbarrel.org/az/2015/04/bp-becomes-shareholder-of-tanap-project/

108 Reuters.com. (March 11, 2015). TANAP gas pipeline project sees shareholding deal with BP soon. Retrieved April 28, 2023, from http://web.archive.org/web/20160127095457/http://www.reuters.com/article/tanap-bp-idusl5n0wd3he20150311

109 TANAP.com. (n.d.). Trans Anatolian Natural Gas Pipeline Project. Retrieved April 28, 2023, from http://web.archive.org/web/20210322180706/https://www.tanap.com/tanap-project/why-tanap/

110 Euro-petrole.com. (n.d.). Statement by the OSCE Minsk group Co-Chair countries. Retrieved April 25, 2023, from http://www.osce.org/mg/51152

111 TANAP.com. (n.d.). Trans Anatolian Natural Gas Pipeline Project.

112 Ibid.

- 49 block valve stations;
- Two off-take stations to supply Turkey's national natural gas network.

Construction of the pipeline was initially suggested at the 3rd Black Sea Energy and Economic Forum, which took place in Istanbul in November 2011. Two memorandums of understanding were signed between Azerbaijan and Turkey to construct the pipeline. The first Memorandum was signed in December 2011, while the second was signed next year, namely in June 2012.[113]

The pipeline was expected to reach its maximum export capacity in 5–8 years after exporting its first natural gas volume. In January of 2021, the pipelines reached their planned capacity, 16bcm.[114] However, it is expected that the ability of the TANAP will reach up to 24bcm/a by 2023–2024[115] and a maximal export volume of 31bcm/a by 2026.[116]

TANAP runs through 20 provinces, 67 districts, and 600 villages, and the pipeline's construction has been realized in three lots. The first section of the pipeline is 375 km long and covers the territory from Türkgözü village, which is located in the Posof district of Ardahan province, to the Askale district of the Erzurum Province, while the length of the second lot is 450 km and runs through Sivas, Erzincan, Gümüshane, and Bayburt. Thelength of the final stretch is 509 km.[117]

The ILF Consulting Engineers realized the project's design and consulting services, while WorleyParsons provided the engineering, procurement, and construction management services. Consequently, all three sections of the project were constructed by different construction enterprises. Fernas Construction built the first section, and the second section was built for $540 million by three enterprises in collaboration: Italian enterprise Sicim, Turkish Yuksel, and Azerbaijani Akkord.

113 Hydrocarbons-technology.com. (n.d.). Trans Anatolian Natural Gas Pipeline Project (TANAP). Retrieved April 28, 2023, from http://web.archive.org/web/20210224180824/https://www.hydrocarbons-technology.com/projects/trans-anatolian-natural-gas-pipeline-project-tanap/

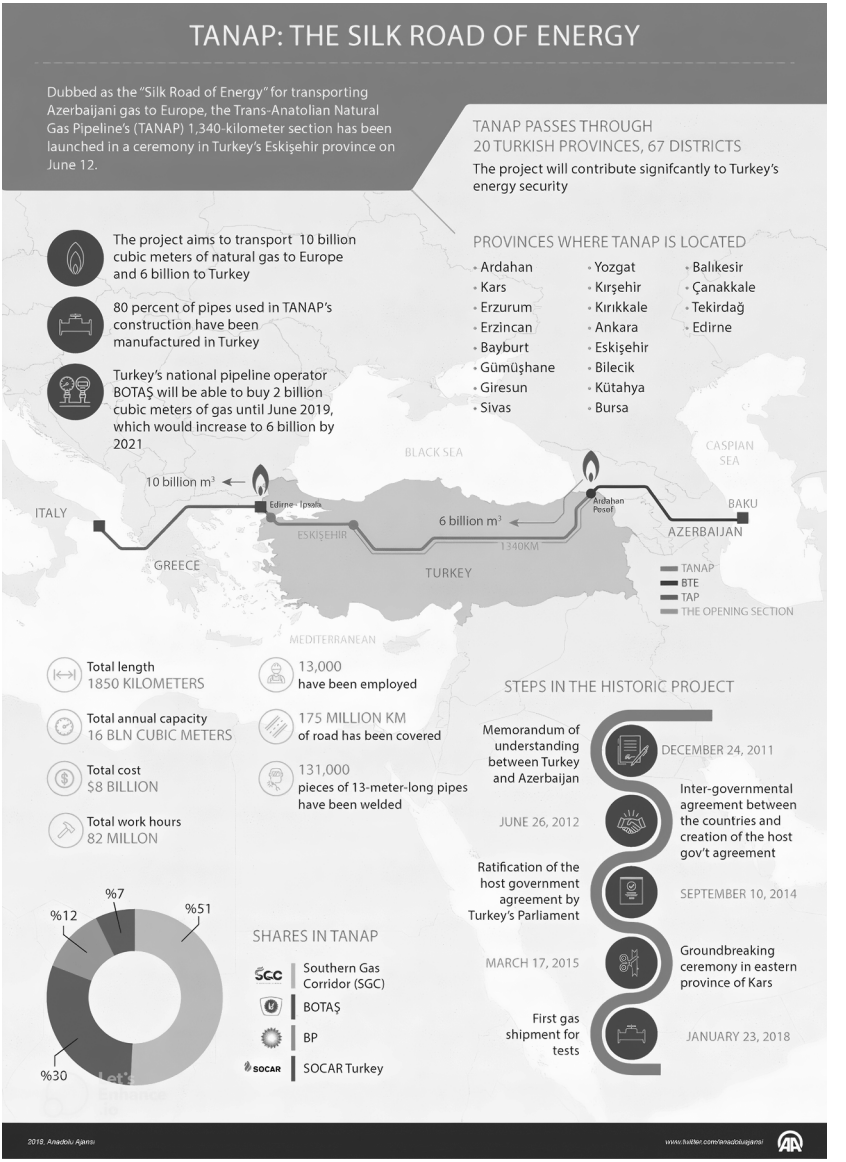
114 Hurriyetdailynews.com. (January 15, 2021). TANAP carrying gas in full capacity: CEO. Retrieved April 28, 2023, from http://web.archive.org/web/20210117085948/https://www.hurriyetdailynews.com/tanap-carrying-gas-in-full-capacity-ceo-161643

115 Socarmidstream.az. (n.d.). Trans Anatolian Natural Gas Pipeline (TANAP) Gas Export Pipeline. Retrieved April 28, 2023, from http://web.archive.org/web/20210109052148/http://www.socarmidstream.az/project/tanap/

116 Hurriyetdailynews.com. (January 15, 2021).

117 TANAP.com. http://web.archive.org/web/20210322180706/https://www.tanap.com/tanap-project/why-tanap/

Map 13: TANAP[118]



118 https://www.dailysabah.com

The Tekfen Turkish Construction and Installation consortium implemented the construction of the third, the last lot.[119]

A contract was signed between the project partners in March 2015, shortly before the construction of TANAP. According to the agreement, BP and BOTAS acquired 12% of TANAP's shares, respectively.[120] In its turn, the SGC Closed Joint Stock Company received 58% of shares. Consequently, the shareholders of the project are:[121]

- SGC (58%);[122]
- BOTAS (30%);
- BP (12%).

5.5.1 Significance for Turkey and the EU

The project is crucial to Turkey's economic and energy security and will also strengthen Turkey's political position as a vital transit hub.[123] Consequently, the Turkish government has stressed its importance for Turkey's energy security.[124]

Considering Turkey's rapidly fast-growing energy demand and population, it would only be realistic to argue that Turkey can partially satisfy its energy needs with this project's help. However, part of its energy demand will be covered through this project.[125]

The construction of the SGC was first planned in the EC's Second Strategic Energy Review in the frames of the EU Energy Security and Solidarity Action Plan way back in 2008.[126] However, the gas crisis between the Russian and Ukrainian governments in 2006 accelerated the project's realization significantly.[127]

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119 Ibid.

120 Caspianbarrel.org. (April 24, 2015). BP becomes shareholder of TANAP project. Retrieved April 28, 2023, from http://caspianbarrel.org/az/2015/04/bp-becomes-shareholder-of-tanap-project/

121 Aslanli, A., & Isayev, A. (2019). Tanap And Tap As Part Of Azerbaijan's Energy Strategy. Economic and Social Development: Book of Proceedings, 642–649.

122 Azerbaijani Republic possesses 51% of the Southern Gas Corridor Closed Joint Stock Company's shares, while 49% of shares belong to SOCAR.

123 Yorucu, V., & Mehmet, O. (2018). The southern energy corridor: Turkey's role in European energy security (pp. 66-67). Cham: Springer International Publishing.

124 Esen, Ömer. "Security of the energy supply in Turkey: Prospects, challenges, and opportunities." International Journal of Energy Economics and Policy 6.2 (2016). 951 Pirani (2018).

125 Pirani (2018).

126 Prontera, A. (2017). Forms of state and European energy security: diplomacy and pipelines in Southeastern Europe. European Security, 26(2), 273-298.

127 Jarosiewicz, A. (2015). The Southern gas corridor. The Azerbaijani-Turkish project becomes part of the game between Russia and the EU. Ośrodek Studiów Wschodnich im. Marka Karpia.

One of the essential issues that the EC confronted in its energy planning strategy for 2020 was improving energy cooperation with extant energy sources and exploring new energy sources for further collaboration.[128] The SGC is a new energy source, and it makes it possible for the EU to get access to the Caspian Region, which would connect the European energy market with the Middle East's energy market.[129] However, it is pretty unrealistic to assume that the EU would meet a significant part of its natural gas demand by realizing the project, as demand outstrips supply.[130]

Meanwhile, it is still hoped that some natural gas-rich countries like Iran and Turkmenistan can supply their natural gas via TANAP, increasing the importance of this project significantly.[131] However, it is not realistic that the plan[132] will make the European gas market utterly independent from Russian gas because the amount of natural gas imported from Russia is so vast that the European energy market cannot deny buying it at this point.[133]

The export of natural gas from other alternative sources can bring the energy security of Europe to another and more stable level and simultaneously decrease its dependency on Russia significantly.[134] Moreover, the SGC project's realization would lead to a fall in natural gas prices in the gas market.

The USA supports the SGC project as a strategic partner of the EU. Consequently, the support of the project by the White House aims at diminishing the natural gas dependency of Brussels on Russia. Washington adhered to the same political strategy when it tried to reduce the oil dependency of the EU on Russia by supporting the BTC oil pipeline.[135]

The amount of natural gas supplied via the TANAP is expected to go up by 31 bcm/a. However, considering Azerbaijan's modest natural gas reserves, the country cannot export more natural gas to the European energy market than initially planned. Nevertheless, there are some alternative natural gas sources. Thus, the TANAP can become one of the most significant natural gas projects of modern

128 Hasanov, F. J., Mahmudlu, C., Deb, K., Abilov, S., & Hasanov, O. (2020). The role of Azeri natural gas in meeting European Union energy security needs. Energy Strategy Reviews, 28, 100464.

129 Ibrayeva (2018).

130 Pirani (2018).

131 Siddi, M. (2019). The EU's botched geopolitical approach to external energy policy: The case of the Southern Gas Corridor. Geopolitics, 24(1), 124-144.

132 Pirani (2018).

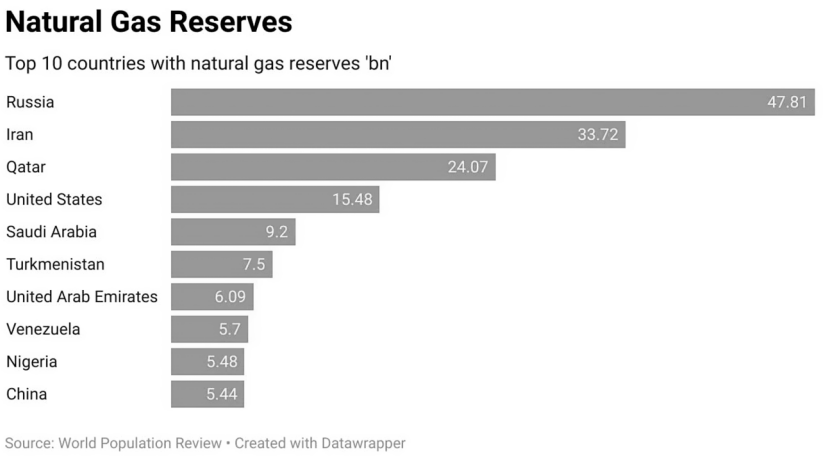
133 Richter, P. M., & Holz, F. (2015). All quiet on the eastern front? Disruption scenarios of Russian natural gas supply to Europe. Energy Policy, 80, 177–189.

134 Hafner, M. (2015). The Southern Gas Corridor and the EU Gas Security of Supply: What's Next. Natural gas europe, 28.

135 Ibid.

energy history if other natural gas suppliers increase the amount of trough pipeline transported gas.[136]

Figure 14: World natural gas reserves for the end of 2021[137]



The countries of the Caspian Region, like Iran and Turkmenistan that are rich in natural gas (see Figure 14), can increase the export capacity of the pipelines. Iran and Turkmenistan are two of the world's six natural gas wealthiest countries.[138] For instance, Iran is the second natural gas richest country on Earth,[139] and its natural gas reserves are over 16 times more than Azerbaijan's stocks.

Turkmenistan, which possesses 9.4% of the world's total proven gas reserves, can also contribute towards increasing the export capacity of TANAP.[140] The following two paragraphs consider the probability of Iran and Turkmenistan joining the TANAP project.

136 Southfront.org. (August 22, 2015). TANAP and the "Battle for Resources". Retrieved April 28, 2023, from http://web.archive.org/web/20201125195120/https://southfront.org/the-battle-for-resources/

137 https://www.worldpopulationreview.com

138 Worldpopulationreview.com. (n.d.). Natural Gas by Country 2021. Retrieved April 28, 2023, from http://web.archive.org/web/20210202233722/https://worldpopulationreview.com/country-rankings/natural-gas-by-country

139 Worldpopulationreview.com. (n.d.). Natural Gas by Country 2021.

140 Frontera.net. (April 1, 2017). Country with World's fourth largest Proven Gas Reserves now only has one Customer. Retrieved April 28, 2023, from https://frontera.net/news/asia/no-hot-air-this-turkmenistan-has-continued-to-lose-natural-gas-buyers/

5.5.2 Hypothetical probability of Tehran's joining

Even supposed all sanctions against Iran are lifted, some critical factors concerning Iran's participation in the project have to be taken into consideration:[141]

- **The strategic partnership between Russia and Iran**. The collaboration between Iran and Russia is essential not only in the Caspian region but also in the Middle East. Furthermore, Russia is a crucial political actor in Iran's policy towards the USA and Israel. If Iran joins the project, this would negatively affect the relations between the strategic partners. The Kremlin is not a supporter of the SGC project, which is initiated to reduce the Russian natural gas monopoly over the EU.[142] Therefore, in the case of its joining and exporting its natural gas through TANAP, Iran can jeopardize its relations with Russia, one of its closest allies alongside China.
- **Policy differences between Iran and Turkey**.[143] Iran has no constant natural gas market to export its gas reserves. Turkey is probably the most reliable and permanent energy market for Iran, so Turkey covers an essential part of its natural gas demand through natural gas imports from Iran. Even though there are relatively acceptable economic relations,[144] there are also some fundamental political differences between the two Muslim countries between Ankara and Tehran, especially in the Syrian crisis.[145]
- **"Poor relations" between Iran and Azerbaijan**. Historically political relations between Azerbaijan and Iran[146] are the most crucial reason why Iran would not be interested in participating in this project. The bilateral relations between the two countries have never been at a high level.[147] Therefore, the government of Iran often accuses Azerbaijan of political cooperation with the West.

141 Southfront.org. (August 22, 2015).

142 Siddi (2019).

143 Sinkaya, B. (2018). The Kurdish question in Iran and its effects on Iran-Turkey relations. British Journal of Middle Eastern Studies, 45(5), 840-859.

144 Akbarzadeh, S., & Barry, J. (2017). Iran and Turkey: not quite enemies but less than friends. Third World Quarterly, 38(4), 980-995.

145 Tür, Ö. (2016). Turkey-Syria relations: Between enmity and amity. Routledge.

146 Hasanli, J. (2006). At the Dawn of the Cold War: The Soviet-American Crisis over Iranian Azerbaijan, 1941– 1946. Rowman & Littlefield Publishers.

147 Hasanli, J. (2018). The Sovietization of Azerbaijan: The South Caucasus in the Triangle of Russia, Turkey, and Iran, 1920–1922. University of Utah Press.

5.5.3 Increasing of export through Turkmen gas

Considering Turkmenistan's tremendous natural gas reserves, Ashgabat's gas export via the TANAP project would dramatically increase the natural gas volume. In a meeting between the Foreign Ministers of Azerbaijan, Turkey, and Turkmenistan in February 2015, the central topic was to export Turkmen natural gas via TANAP.

The ceremony for laying the Turkish part of the project took place in the Turkish city of Kars on 17 March 2015. Nevertheless, there are also "barriers" to joining Turkmenistan in this project. Turkmenistan ships the lion's share of its natural gas resources to China[148] and Russia. Gazprom officially announced that it had stopped purchasing natural gas from Turkmenistan in January 2016.[149] However, it could have been predicted that Russia would not have refused to buy Turkmen gas for a moderate price for a long time, taking into account the Kremlin's critical political influence over the Turkmen government, so Russian restarted transporting natural gas from Turkmenistan in 2019.[150] Moreover, there is an agreement with Tehran about supplying Turkmen gas to Iran, so Turkmenistan provides to Iran about 9 bcm/a gas.[151]

Besides, a new agreement was signed with China to increase the amount of exported gas. Therefore, considering "poor" political relations with Europe and the relatively friendly political and economic ties with China and Russia, Ashgabat is more interested in supplying its natural gas to Beijing and Moscow than European countries.

Indeed, it would be a very optimistic scenario for Brussels to convince Turkmenistan to join the project. Consequently, the active involvement of the European energy enterprises in the gas production industry of Turkmenistan might be a positive step towards the future export of Turkmen gas through TANAP. However, it is believed that as the state budget of Turkmenistan loses the lion's share of "gas money" through the participation of the Western energy enterprises, Ashgabat is

148 Kong, Z., Lu, X., Jiang, Q., Dong, X., Liu, G., Elbot, N., ... & Chen, S. (2019). Assessment of import risks for natural gas and its implication for optimal importing strategies: A case study of China. Energy policy, 127, 11–18.

149 Thediplomat.com. (January 6, 2016). Russia's Gazprom stops buying gas from Turkmenistan. Retrieved April 28, 2023, from http://web.archive.org/web/20210209042051/https://thediplomat.com/2016/01/russias-gazprom-stops-buying-gas-from-turkmenistan/

150 Thediplomat.com. (April 25, 2019). Russia is buying Turkmen gas again. Why? Retrieved April 28, 2023, from http://web.archive.org/web/20210209042048/https://thediplomat.com/2019/04/russia-is-buying-turkmen-gas-again-why/

151 Reuters.com. (January 3, 2017). Turkmenistan limits natural gas supplies to Iran over arrears. Retrieved April 28, 2023, from http://web.archive.org/web/20190702071606/https://www.reuters.com/article/us-iran-turkmenistan-gas-violation-iduskbn14n1t9

not interested in a collaborative project with the EU and European energy companies.[152]

5.6 Nabucco

The idea to build a pipeline route to export natural gas from the SD 2 to Europe appeared after visiting Verdi's famous "Nabucco" Opera at the State Opera in Vienna. The shareholders were from Germany, Austria, Hungary, Romania, Bulgaria, and Turkey. Therefore, this project was named in honor of Verdi's well-known Nabucco Opera.

The Nabucco project was planned in 2002. This project's main target was the diversification of natural gas sources in Europe and diminishing the natural gas dependency of the European energy market on Russian natural gas. It was initially planned to export 31 bcm of natural gas by 2020, estimated as 5–10% of Europe's total natural gas consumption. However, only Azerbaijan announced its readiness to export almost 10 bcm/a natural gas via the Nabucco pipeline despite all favorable prognoses and expectations.[153]

However, since Azerbaijan could only export part of the planned 31 bcm/a natural gas volume, finding other natural gas sources was necessary to increase the pipeline's export capacity. Turkmenistan was considered the most probable country that could significantly increase the amount of exported gas. Nevertheless, the plan failed because of some political misunderstandings between official Baku and Ashgabat and the Caspian Sea's legal status.[154]

The Nabucco pipeline would have covered almost 4000 kilometers of area. Therefore, in the case of its realization, the planned pipeline would have crossed the territories of Azerbaijan, Bulgaria, Romania, Hungary, and Austria (see Map 14).[155] Considering the chosen TAP pipeline starts from the Turkish-Greek borders. It crosses Greece and Albania's territories and exports natural gas extracted from the SD 2 to

152 Frontera.net. (April 1, 2017).

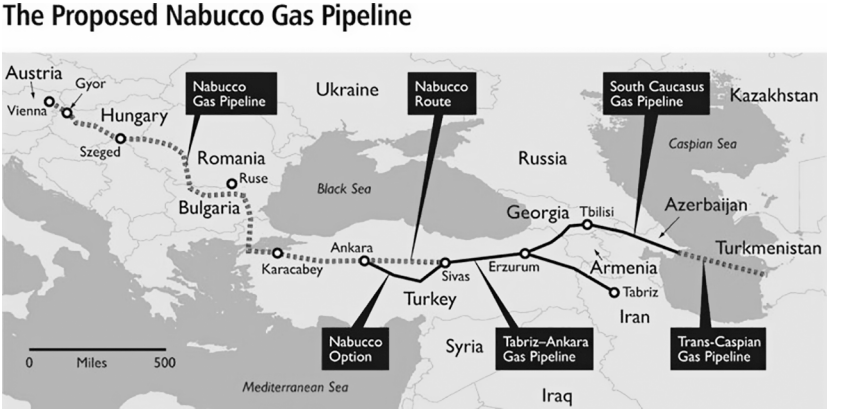
153 Balkaninsight.com. (July 1, 2013). Nabucco gas pipeline failure hits Romania, Bulgaria. Retrieved April 28, 2023, from http://web.archive.org/web/20131019090021/http://www.balkaninsight.com/en/article/failed-nabucco-project-to-affectromania-bulgaria

154 Marketos, T. (2009). Eastern Caspian Sea energy geopolitics: a litmus test for the US-Russia-China struggle for the geostrategic control of Eurasia. Caucasian Review of International Affairs, 3(1), 2.

155 Barysch, K. (2010). Should the Nabucco pipeline project be shelved?. Centre for European Reform.

Italy under the Adriatic Sea. Therefore, TAP distinguishes it from Nabucco with its fewer transit states.[156]

Map 14: Nabucco project[157]



Nabucco should have been a "bridge natural gas project" between Asia and Europe and the main pipeline of the SGC. Moreover, it would have been connected to two of the world's richest energy regions: the Caspian Region and the Middle East with Europe.[158] The project's realization would have meant the diversification of the natural gas sources for some European countries and the noticeable reduction of their natural gas dependency on Russia.[159] Meanwhile, Russia will remain the leading natural gas supplier for Europe in the near future,[160] despite all the progress achieved in diversified gas shipments to Europe, imported LNG from the USA, renewable energy resources, etc.[161]

156 Lajtai, R., Czinkos, A., & Dinh, T. (2009, October). Nabucco vs. South Stream: the effects and feasibility in the Central and Eastern European Region. In 24th World Gas Conference Buenos Aires, Argentina (pp. 5–9).

157 https://www.eurodialogue.org

158 Barysch (2010).

159 Fernandez, R. (2011). Nabucco and the Russian gas strategy vis-a-vis Europe. Post-Communist Economies, 23(01), 69-85.

160 DW.com. (February 4, 2019). Nord Stream 2 pipeline row highlights Germany's energy dependence on Russia. Retrieved April 28, 2023, from https://www.dw.com/en/nord-stream-2-pipeline-row-highlights-germanys-energy-dependence-on-russia/a-47344788

161 Popovic, N. (February 24, 2020). The Energy Relationship between Russia and the European Union. Retrieved April 28, 2023, from https://www.e-ir.info/2020/02/24/the-energy-relationship-between-russia-and-the-european-union/

On 26 June 2013, OMV, the internationally integrated Oil and Gas Company of Austria, officially reported the Nabucco project's failure and implementation of the new TAP project to replace Nabucco. After announcing Nabucco's loss, Azerbaijan, Turkey, Switzerland, Norway, and Germany announced their support for this more economically rentable project that can export natural gas through the shortest route from Azerbaijan to Italy via Turkey.[162]

5.6.1 Failure reasons

The final stage in eliminating the project was a capital investment in TANAP's favor. The costs of the Nabucco were estimated at almost $10 bn. Even after implementing some reforms like reducing expenditure costs, choosing a shorter export route, and using existing pipeline routes, it did not become possible to create an economically profitable pipeline route for Nabucco.[163] Consequently, the project's failure against TAP can be characterized as the economy's dominance over politics.[164]

Another crucial point of Nabucco's failure was the need for more solidarity and cooperation between European countries., Some European countries chose the South Stream project initiated by Russia. The South Stream was a critical competitive project against Nabucco. Russia increased its political pressure on Bulgaria, Romania, and Hungary to choose the South Stream project of Gazprom instead of Nabucco. Consequently, Russia achieved a more dominant and uncompetitive position in the Central and Eastern European energy markets with its victory over Nabucco.[165]

TAP was chosen in late 2013 as a project to export natural gas from Azerbaijan through Turkish-Greek borders to Italy. However, Italy possesses diversified gas sources, while East European countries like Bulgaria, Hungary, and Romania are still significantly dependent on Russian natural gas resources. Nabucco's implementation would have substantially reduced these countries' natural gas dependency on Russia.

The EU and the USA lost sight of their goals in the region too. For the last few years, the USA and Europe have forgotten their primary political goal of the 1990s. This meant Russia's prevention using its energy resources to dictate "its own game"

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162 Aa.com.tr. (June 27, 2013). Nabucco project fails, placed by Trans Adriatic Pipeline project. Retrieved April 28, 2023, from http://web.archive.org/web/20200223130827/https://www.aa.com.tr/en/turkey/nabucco-project-fails-placed-by-trans-adriatic-pipeline-project/235841

163 Skalamera, M. (2018). Revisiting the Nabucco Debacle: Myths and Realities. Problems of Post-communism, 65(1), 18–36.

164 Okumus, O. (2013). What did Turkey lose when EU lost Nabucco. Al Monitor Turkey Pulse.

165 Reuters.com. (May 1, 2014). Don't cry for the Nabucco pipeline. Retrieved April 28, 2023, from http://web.archive.org/web/20210125013237/http://blogs.reuters.com/great-debate/2014/05/01/dont-cry-for-the-nabucco-pipeline/

against the West. Consequently, Russia remains the primary energy supplier for Europe and the Western energy markets, and the Kremlin uses its gas resources as a political weapon.[166]

The USA had a more stable and active energy policy in the Caspian Region in the 1990s.[167] However, the Obama administration established other priorities to avoid direct political opposition with Russia.[168] Washington turned its attention to its internal issues after the broad usage of shale gas. Therefore, because of a lack of assertive political support,[169] official Baku had to avoid direct political opposition from Russia. Nevertheless, Azerbaijan could have been more decisive in its energy policy towards Europe to provide substantive political support from the USA and EU.[170]

5.7 TAP

The TAP pre-feasibility study started on January 1, 2003, so the Swiss EGL Energy Supplier Company undertook the project's feasibility study. TAP AG was officially registered as a joint venture TAP AG in Switzerland on March 13, 2007.[171] There were two route preferences for the export of natural gas from the Caspian Sea to Europe:[172]

- Northern pipeline route via Bulgaria-Macedonia-Albania;
- Southern pipeline route via Greece and Albania.

After all the intense discussions and negotiations, the southern route, the pipeline through Greece and Albania, was chosen as a more reliable route for realizing the TAP project.[173] This was a reconciliation between the Swiss energy company EGL Group and the Norwegian energy enterprise Statoil about creating the TAP AG on 13

166 Reuters.com. (May 1, 2014).

167 Kalicki, J. H. (2001). Caspian energy at the crossroads. Foreign Aff., 80, 120.

168 Olcott, M. B. (2009). A New Direction for US Policy in the Caspian Region. Carnegie Endowment for International Peace.

169 Ibid.

170 Ismail, M. A. (2009). Is the West Losing the Energy Game in the Caspian?. CA-CI Analyst, http.

171 Tap-ag.com. (n.d.). Feasibility and establishment of TAP (2003 – 2007). Retrieved April 30, 2023, from http://web.archive.org/web/20200920135608/https://www.tap-ag.com/the-pipeline/project-timeline/tap-project-milestones

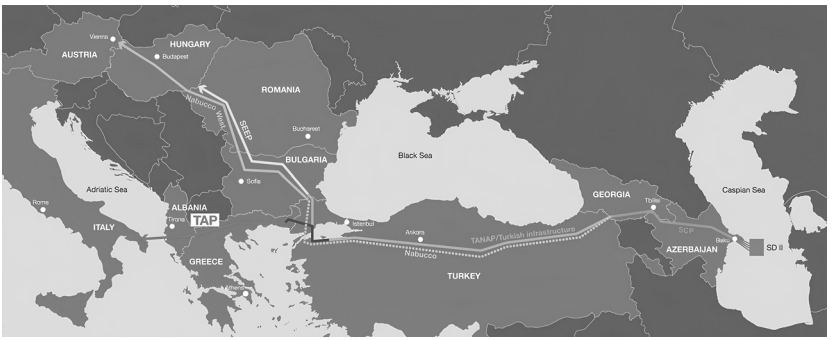
172 Egl.eu (March 13, 2007). Natural gas pipeline through Adriatic achieves major milestone. Natural Gas Pipeline through Adriatic Achieves Major Milestone, Retrieved April 30, 2023, from web.archive.org/web/20120308073539/www.egl.eu/eglch/en/home/media/news/archive/2007/2007_03_13.html

173 Giamouridis, Anastasios. Natural Gas in Greece and Albania: supply and demand prospects to 2015. Oxford Institute for Energy Studies, 2009.

February 2008.[174] A petition by the TAP AG and the Greek government in June 2008 on the design, construction, and ownership of an Independent Natural Gas System was filed.[175] The TAP country offices were established in January 2010 in all member countries of the project: Albania, Greece, and Italy.[176]

TAP was officially approved as a pipeline for gas export from the SD 2 natural gas field to Europe instead of the failed Nabucco in June 2013.[177] TAP crosses the territory of Northern Greece after the connection of TANAP with TAP. Meanwhile, it is the longest distance of the project. TAP will further go onwards, east to west through Albania to the Adriatic coast. Eventually, the pipeline will go from Italy to Western Europe[178] (see Map 15).

Map 15: TAP[179]



The entire TAP length is 878 km: Greece 550 km, Albania 215 km, the Adriatic Sea 105 km, and Italy 8 km, respectively.[180] The highest position (1800m) of the pipeline

174 Statoil.com. (2008). Joins EGL in Trans Adriatic Pipeline Gas Project. Retrieved April 30, 2023, from http://www.statoil.com/en/newsandmedia/news/2008/pages/transadriatic.aspx

175 Tap-ag.com. (June 19, 2008). Trans Adriatic Pipeline seeks approval to build gas system in Greece. Retrieved April 8, 2023, from http://web.archive.org/web/20160710084616/http://www.tap-ag.com/news-and-events/2008/06/19/trans-adriatic-pipeline-seeks-approval-to-build-gas-system-in-greece

176 Bilalli, M. (2016). Geopolitics of Albania–possibility of involving Republic of Kosovo in the pipeline–TAP.

177 Bocse, A. M. (2018). European gas supply security: Explaining the EU external Gas pipeline choices. In The international political economy of Oil and Gas (pp. 41-56). Palgrave Macmillan, Cham.

178 Ortis, A. (2015). Europe, Italy and TAP Project.

179 https://www.americansecurityproject.org

180 Naturalgasworld.com. Inauguration in Greece to take place may 17. (May 16, 2017). Retrieved April 28, 2023, from https://www.naturalgasworld.com/tap-inauguration-to-take-place-may-17-29582

is in Albania's mountains, while the lowest part (820 m) of the project is observed beneath the sea. The offshore part starts close to Albania's Fier city, crosses the Adriatic Sea, and further connects with Italy's natural gas system in the southern part of the country.[181]

The energy giants such as BP, SOCAR, Total, and Fluxys acquired the project's shares and officially joined the project on 30 June 2013. Therefore, TAP's shareholding consists of the following energy companies:[182]

- BP (20%)
- SOCAR (20%)
- Snam (20%)
- Fluxys (19%)
- Enagas (16%)
- Axpo (5%)

The EU supports the TAP project. The realization of this project is a very significant step towards the diversification of the natural gas sources of the EU. Hence, the EC Parliament granted this project and European Council (EUCO) the status of "Project of Common Interest."[183]

The natural gas export towards the European energy market via TAP was planned to start by early 2020. However, the commercial gas export was delayed and began by January 2021.[184] This project's realization is estimated as an excellent opportunity for some European countries to diversify their energy sources in the common European energy market. In its turn, Azerbaijan will have a unique occasion to profit economically from this project.[185]

According to the press release of the EC, TAP will have some advantages for the EU and participated countries:[186]

181 Tap-ag.com. (n.d.). TAP route and infrastructure. Retrieved April 8, 2021, from http://web.archive.org/web/20210322180703/https://www.tap-ag.com/infrastructure-operation/tap-route-and-infrastructure

182 Naturalgasworld.com. Inauguration in Greece to take place may 17. (May 16, 2017).

183 EC.europa.eu (May 3, 2016). State Aid: Commission approves agreement between Greece and TAP allowing new gas pipeline to enter Europe. Retrieved April 28, 2023, from https://ec.europa.eu/commission/presscorner/detail/en/ip_16_541

184 Offshore-energy.biz. (January 4, 2021). Azerbaijan sends first gas export via TAP pipeline. Retrieved April 28, 2023, from http://web.archive.org/web/20210113200043/https://www.offshore-energy.biz/azerbaijan-sends-first-gas-export-via-tap-pipeline/

185 Keeptalkinggreece.com. (May 17, 2016). PM Tsipras inaugurates TAP gas pipeline, a $45-billion project. Retrieved April 28, 2023, from http://web.archive.org/web/20170921103649/http://www.keeptalkinggreece.com/2016/05/17/pm-tsipras-inaugurates-tap-gas-pipeline-a-45-billion-project/

186 EC.europa.eu. (May 3, 2016).

- The project will contribute to the further diversification of European energy supply sources and routes: it will bring gas from the Caspian Sea region, and potentially the Middle East, to the EU;
- Competition on the European gas market will be increased thanks to the extra volumes of gas and new supply route;
- The project will be funded entirely by private investment and will generate revenues in its Greek part only from the tariffs paid by clients shipping gas on the pipeline;
- The aid is in the form of a specific tax regime that, depending on whether tax rates increase or decrease, will lead TAP to pay more or less tax than it would without the aid. If the rates increase, the assistance will be limited to the minimum tax benefit for TAP;

5.7.1 Significance for host countries

The TAP realization will positively influence the host countries to get a particular volume of natural gas. Moreover, the project will also bring an essential economic dividend to the state budgets of the nations. For this reason, the realization of the project is in the common interest of all active participants.

The Albanian and Italian governments reached an interstate agreement on 10 March 2009. The contract was signed by Genc Ruli, the Minister of Economic, Trade, and Energy of Albania, and Claudio Scajola, Italy's Economic Development. The agreement is a project of common interests for both states. It implies the creation of energy cooperation between Albania and Italy and promotes the interconnection and integration of electric energy and natural gas systems.[187]

The Albanian, Greek, and Italian governments announced their political backing of the project on 28 September 2012, so support was officially confirmed through an agreement over the member countries' Memorandum of Understanding.[188]

Some main advantages of the TAP project for the host countries:[189]

187 Tap-ag.com. (March 12, 2009). Intergovernmental Agreement between Albania and Italy: Important Milestone for the Trans Adriatic Pipeline Project Achieved. Trans Adriatic Pipeline (TAP). Retrieved April 28, 2023 from https://www.tap-ag.com/news-and-events/2009/03/12/intergovernmental-agreement-between-albania-and-italy-important-milestone-for-the-trans-Adriatic-pipeline-project-achieved

188 Tap-ag.com. (September 28, 2012). Italy, Greece, Albania confirm political support for TAP with signing of MoU. Retrieved April 28, 2023, from https://www.tap-ag.com/news/news-stories/italy-greece-albania-confirm-political-support-for-tap-with-signing-of-mou

189 Tap-ag.com. (n.d.). Social and environmental investments. Retrieved April 28, 2023, from http://web.archive.org/web/20210115235715/https://www.tap-ag.com/sustainability/social-and-environmental-investments

- Direct contribution to GDP through taxes.
- Direct and indirect employment during construction and operation.
- Procurement of goods and services through eligible suppliers.
- Social and environmental investment: community investment programs.
- Access to roads and bridges in Albania.

Albania. TAP will initiate economic development in the country and advance the energy sector and play an essential role in stimulating foreign capital investments in the economy of one of the economically poorest countries of Europe. Consequently, the TAP project is one of the most significant projects in Albanian history.

Therefore, just in 2017, the TAP project brought to Albania's budget almost $430 million. It is awaited that the entire investment brought by the project to this country will be around €1.5 bn.[190] Further, Albania will have more sustainable political and economic relations with the European countries. However, Albania's most crucial dividend from the realization of this project is the increasing the significance of country's geographic position. Moreover, TAP will play a significant role in developing Albanian's internal energy market.

Greece. Greece started construction of its part of the pipeline on 17 May 2016. Greece has been in a deep economic crisis for the last few years. Therefore, the most crucial advantage of Greece's project, which needs significant foreign capital investment to overcome this difficult period in its economy, is a direct investment from the TAP. Moreover, TAP is an excellent source for Greece to stimulate the creation of new jobs. It is estimated that the total profit Greece will get from the realization of the project equals 8000 new jobs and €1.5 bn. direct investment, which in Greece's crisis period should be considered a vital economic profit for the country.[191]

Italy. Thanks to the project, Italy will get an additional volume of natural gas to diversify its natural gas sources and minimize its dependency on traditional energy sources. There are two crucial energy suppliers for Italy: Russia and Algeria. Both of them can be seen as unstable suppliers. Russian natural gas is imported via Ukraine, which cannot be counted as a secure natural gas source because of the war initiated

190 Seenews.com. (February 7, 2017). TAP project to bring 400 mln euro investments to Albania in 2017. Retrieved April 28, 2023, from http://web.archive.org/web/20170207133611/https://seenews.com/news/tap-project-to-bring-400-mln-euro-investments-to-albania-in-2017-557170

191 Euractiv.com (May 17, 2016). Greece starts work on Azeri gas pipeline. Retrieved April 28, 2023, from http://web.archive.org/web/20210213150618/https://www.euractiv.com/section/energy/news/greece-starts-work-on-azeri-gas-pipeline/

by the Kremlin against Ukraine.[192] The natural gas from Algeria, exported through Tunisia, is a second source, which suffers from terrorism, and especially Nord of Tunisia is very unstable.[193]

TAP will supply 8 bcm of natural gas. However, Italy will absorb only 10% of the imported volume, so the rest of the natural gas might be provided to other European countries.[194]

5.8 Kashagan

The Kashagan oil field is one of the largest oil fields in the Caspian Region and one of the world's largest energy fields, taking into account its enormous energy potential. The energy reservoir is located in the southeast part of Atyrau that belongs to Kazakhstan's part of the Caspian Sea. The field's energy reserves are estimated to be 9–13 bb and are expected to produce between 4.0-8.0 mt of oil annually.[195]

According to the New York Times, the Kashagan oil field was the most significant since the Prudhoe Bay oil field was discovered in Alaska in 1968.[196] By the beginning of the 2000s, it was believed that just recoverable oil reserves of the field could reach up to 30 bb in the early stages of its exploration.[197]

After independence, the Kazakh government hoped to profit heavily from the oil and gas field. The former president of Kazakhstan, Nursultan Nazarbayev, said that Kazakhstan would turn into one of the world's wealthiest oil countries and even compete with Saudi Arabia for the most significant oil supplier in the world

192 Verda, M. (2014). Contribution of TAP to the Italian economy. International Journal of ISPI & Analysis, 256, 1–9.

193 Issafrica.org. (July 1, 2019). Terrorism in Tunisia: More than just foreign connections. Retrieved April 28, 2023, from http://web.archive.org/web/20200926025726/https://issafrica.org/iss-today/terrorism-in-tunisia-more-than-just-foreign-connections

194 Mediterraneanaffairs.com. (March 11, 2015). TAP: An increasingly important opportunity for Italy and Europe. Retrieved April 28, 2023, from http://web.archive.org/web/20210121103322/https://www.mediterraneanaffairs.com/tap-transadriatic-pipeline-gas-energy-security-europe/

195 Reuters.com. (November 21, 2016). UPDATE 2-Kashagan oil field starts commercial output. Retrieved April 28, 2023, from http://web.archive.org/web/20161123174535/http://www.reuters.com/article/kazakhstan-kashagan-idusl8n1dm1qp

196 Nytimes.com. (September 11, 2013). Kazakhstan oil field begins production after years of delay. Retrieved April 8, 2023, from http://web.archive.org/web/20201110001146/https://www.nytimes.com/2013/09/12/business/global/kazakhstan-oil-field-starts-production-after-years-of-delay.html

197 Theguardian.com. (February 2, 2021). TotalFina guzzles BP's oilfield stake. Retrieved April 28, 2023, from http://web.archive.org/web/20140509183713/http://www.theguardian.com/business/2001/feb/03/bp

by 2015.[198] However, the delays in different development stages became the main obstacle to fully realizing the energy field's potential.

The Kazakh government reported its intention to start the exploration of the Kashagan oil field in 1992. The international energy enterprises' enormous interests in taking part in the Kazakhstan Caspian shelf should be considered a massive potential area. The companies' list included tremendous global energy companies like Eni, BG Group, BP/Statoil, ExxonMobil, Royal Dutch Shell, and Total.[199] The composition of member companies has changed over the years.

Eni energy consortium of Italy was chosen as the only operator of the project in 2001. A new operating organization Agip KCO was then established. Kazakhstan's national oil company, KazMunayGas, joined the Consortium in May 2005 and became an essential part of this project.[200]

The "North Caspian Sea Production Sharing Agreement" (NCSPSA) was officially signed on 18 November 1997. One year later, an international corporation was created called the Offshore Kazakhstan International Operating Company (OKIOC). The reason for the establishment of the OKIOC was a scrutinizing and production of hydrocarbons within the NCSPSA area. The area covered by the NCSPSA reaches 5600 km².[1028] A binding contract between the Kazakh government and Agip Kazakhstan North Caspian Operating Company (NCOC) was signed on 31 October 2008, and NCOC took control of the project.[201]

NCOC was approved as a new operator of the project in January 2009, so the new operator started to function under the NCSPSA. Therefore, the field operator, NCOC, substituted Agip KCO, operating this project after ENI. NCOC BV is the primary operator of the seven co-venture consortium partners and developed the Kashagan oil field but also other 11 offshore blocks: Aktote, Kairan, and Kalamkas under NCSPSA.[202]

The shares of the KazMunayGas reached 16.81% after receiving additional shares in January 2008, and it equated with Eni, ExxonMobil, Total, and Royal Dutch Shell, which possess the same percentage of shares at 16.81%. Consequently, the increase of KMG's shares meant an automatic decrease in ENI shares, Total SA ExxonMobil, and Shell, so the stakes of these giant energy companies reduced from 18.52% to 16.81.

198 Theguardian.com. (February 2, 2021).

199 Henni, A. (2014). The Mystery of the Kashagan. Society of Petroleum Engineers, 24.

200 Project Factsheet – North Caspian Operating Company. (n.d.). Retrieved April 28, 2023, from https://www.yumpu.com/en/document/view/9418868/project-factsheet-north-caspian-operating-company

201 Project Factsheet – North Caspian Operating Company. (n.d.).

202 Yenikeyeff, S. M. (2008). Kazakhstan's gas: export markets and export routes. Oxford Institute for Energy Studies.

In comparison, the shares of ConocoPhillips and Inpex decreased from 9.26% and 8.33% to 8.40% and 7.56%, respectively.[203]

The field's oil production capacity, which is the first offshore oil and natural gas project in the history of Kazakhstan, is so enormous that the production volume of many oil fields in the world is not even comparable with it. However, there are some difficulties in the area's development despite all the reassuring promises. Considering its problematic nature, the Kashagan oil field belongs to the "hard-developing" oil and gas fields. It is almost impossible to implement conventional development techniques to develop the oil and gas field because of some factors, such as its vast range, shallow waters, and climate structure.[204]

The development of the Kashagan oil field needs a very complex technological approach due to the oil field's geographical location. For instance, once the northern part of the Caspian Sea is frozen due to the harsh winter between November and March and has an extremely high temperature in summer, the development is followed by very significant logistical cruxes. The average thickness of ice reaches up to 0.6-0.7 m. in winter.[205] There are also other technical challenges:[206]

- Deep reservoir – 5,000 m;
- High reservoir pressure – 800 bar;
- High H2S (Hydrogen Sulphide) content (16–20%);
- Management of by-products, such as sulfur;
- Use of sour gas re-injection into the reservoir.

> "This is one of the most complicated projects in the world. It's a historical moment. It's first-quality oil, very light oil, close to growing countries, and presents the best markets. It's very important to prove to everybody that we are able to develop this type of complex reservoir, said Claudio Descalzi, the chief operating officer for exploration and production at Eni, the Italian oil company involved in the project."[207]

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203 Levine, R. M., Brininstool, M., & Wallace, G. J. (2001). The Mineral Industry of Kazakhstan. Minerals Yearbook 2009.

204 Ogj.com. (October 31, 2008). Kazakhstan, consortium agrees to new Kashagan terms. Retrieved April 28, 2023, from http://web.archive.org/web/20180612164424/https://www.ogj.com/articles/2008/10/kazakhstan-consortium-agrees-to-new-kashagan-terms.html

205 Foeeurope.org. (n.d.). Kazakhstan, Kashagan oil field development. Retrieved April 28, 2023, from https://www.foeeurope.org/sites/default/files/publications/foee_kashagan_oil_field_development_1207.pdf

206 Foeeurope.org. (n.d.).

207 Nytimes.com. (September 11, 2013).

However, despite so many difficulties concerning the field's development, some energy enterprises do not lose their optimism and hope that this field will reach its potential soon. For instance, a deal worth $45 bn. was signed between the KMGs and CNPC, owned by the Chinese government, on 7 September 2013. According to the agreement, CNPC acquired 8.33% of the shares.[208] The Memorandum was signed between companies on 13 and 14 November 2019. The cooperation between companies and the Ministry of Energy of the Republic of Kazakhstan should be expanded due to these Memorandums.[209]

5.8.1 Resumed production after many years of delay

The complex reservoir development was delayed for many years because of the above-mentioned technical challenges and disagreements between the Kazakh government and participant energy companies. After that, oil production from one of the world's largest oil fields and one of the most significant outside of the Middle East was renewed once again on 11 September 2013. However, the volume of production was relatively insignificant in the first phase of the output. Therefore, the initial quantity of produced oil reached 26.000 bpd. Despite all positive expectations, oil production was stopped again in just 13 days because a gas leak was discovered at the pipeline between Island D and the onshore Bolashak refinery. After this was fixed, another leak was discovered in another part.[210]

However, on 1 June 2015, positive news concerning the renewal of the Kashagan field's development was announced again, this time by the Energy Minister of Kazakhstan, Vladimir Shkolnik. Consequently, the Energy Minster stressed in his speech in the Parliament of Kazakhstan that all oil and natural gas pipelines in the field were renewed.[211] Therefore, the production from the reservoir was restarted after almost 16 years of delay.[212] According to Financial Times, the capital was invested

208 Reuters.com. (September 7, 2013). China buys into giant Kazakh oilfield for $5 billion. Retrieved April 28, 2023, from http://web.archive.org/web/20201002114143/https://www.reuters.com/article/us-oil-kashagan-china-idusbre98606620130907

209 Cnpc.com. (November 18, 2019). CNPC signs two Cooperation Agreements in Kazakhstan. Retrieved April 28, 2023, from http://web.archive.org/web/20200730152450/http://www.cnpc.com.cn/en/nr2019/201911/ee775876ac924114a50c0049087275f8.shtml

210 Gasandoil.com. (July 10, 2015). Kashagan oil field comes back to life. Retrieved April 28, 2023, from http://www.gasandoil.com/news/2015/07/kashagan-oil-field-comes-back-to-life

211 Ibid.

212 Ft.com. (June 13, 2014). Kazakhstan to extend contract for $50bn Kashagan oil project. Retrieved April 28, 2023, from http://web.archive.org/web/20180620162127/https://www.ft.com/content/9cbc3c7e-f2e1-11e3-a3f8-00144feabdc0

in the field's development during the years of its delay was estimated at $50 bn. by the end of 2016.[213]

After resuming the development, the first export was shipped through the CPC and KazTransOil pipelines. According to the Energy Ministry of Kazakhstan, almost 26.500 metric tons of crude oil was loaded into the country's pipelines for export in the first phase after years of delay. However, according to the Energy Ministry, Kazakhstan needs enough time to reach the required production volume.[214]

The field's budget was estimated by energy experts to be around $38 bn. by 2008, while it grew up to 53 $ bn. by the end of 2015 because the partners had to change undersea links after the gas leak. Meanwhile, the current oil prices were less than 50% of the costs in 2013, so if the oil prices in 2013 were $105.87 for a barrel, one barrel of crude oil now costs only $41.47.[215] It means that Kazakhstan's budget will receive almost twice less than in 2013. Moreover, one factor is certain that in the case of fixing continuous oil production from the field, the exported oil price will be one of the most expensive because of the high manufacturing costs.

The developed oil from the Kashagan oil field reached 90,000 bpd in October 2016.[216] The estimated daily capacity that the field has to reach is 370,000 bpd, according to the NCOC. However, it seems almost impossible to get a proposed production while 154.000 is the field's highest production capacity, according to Wood Mackenzie Ltd.[217] Consequently, the field produced only 58.3 mt oil and condensate in the first eight months of 2020.[218] Nevertheless, in 2023, production at the Kashagan field reached a level of approximately 18.8 mt. Additionally, on January 11, 2024, the operator of the Kashagan field, NCOC (North Caspian Operating Company), announced that it had achieved a significant production milestone of 100 mt of oil since the start of production.[219]

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213 Royaldutchshellgroup.com. (October 14, 2016). Oil from $50 billion Kashagan field starts flowing to export. Retrieved April 28, 2023, from http://web.archive.org/web/20201031042705/https://royaldutchshellgroup.com/2016/10/14/oil-from-50-billion-kashagan-field-starts-flowing-to-export/

214 Ibid.

215 OPEC oil price annually 1960-2021, Retrieved April 28, 2023, from http://web.archive.org/web/20210402004921/https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/

216 Astanatimes.com. (December 5, 2016). More than 350,000 tonnes of Kashagan oil shipped for export. Retrieved April 28, 2023, from http://web.archive.org/web/20170503161816/http://astanatimes.com/2016/12/more- than-350000-tonnes-of-kashagan-oil-shipped-for-export/

217 Royaldutchshellgroup.com. (October 14, 2016).

218 Neweurope.eu. (September 10, 2020). Oil production at Kashagan in 8 months amounts to 10.4 million tonnes. Retrieved April 28, 2023, from https://www.neweurope.eu/article/oil-production-at-kashagan-in-8-months-amounts-to-10-4-million-tonnes/

219 Rogtecmagazine.com. (2024, February 9). Production at Kashagan in 2023 reached a Record Level – about 18.8 million tons. Retrieved March 08, 2024, from https://www.rogtecmagazin

5.9 Tengiz

One of the world's largest oil and gas fields, the Tengiz oil and gas field, was explored at 4 km depth in the northwestern part of Kazakhstan when the country was still part of the USSR. Still, the development of the oil and gas field first began 49 years later, in 1979, despite its detection in 1930.[220] However, because of some technical challenges in the development of the reservoir, as in the case of the Kashagan field, the Tengiz had remained undeveloped for many years. Therefore, the first investigations made it clear that it is more complex to develop the energy reserves of the Tengiz field with common technological resources because of the area's high pressure and high hydrogen sulfide content. Without high technology, it won't be easy to develop it.[221]

Tengiz is a project license area, which includes the immense Tengiz oil and gas field and some exploratory prospects, and a significant Korolev field, six times smaller than the Tengiz. The area is placed in the world's deepest advanced gigantic oil and gas fields, with the top of the reservoir nearly 4000 meters (13000 feet). The width of the pool reaches 19 kilometers, while its length is 21 kilometers. The territory covered by the field is calculated as 2500 km^2.[222]

It is believed that the Tengiz field possesses 26 bb oil reserves. However, only 6–9 bb of them are recoverable. The Tengiz field production for the second half of 2020 was around 570,000 b/d, which is significantly under the area's estimated potential,[223] In 2023, the Tengiz field yielded a total of 28.9 mt of oil.[224] The total recoverable crude oil of Tengiz and the nearby Korolev fields is estimated at 6.4-10.7 bb.[225] The oil resources of the Tengiz field are extracted at a very high pressure, which is

e.com/production-at-kashagan-in-2023-reached-a-record-level-about-18-8-million-tons/#:~:text=Production%20at%20Kashagan%20in%202023%20reached%20a%20record%20level%20of,since%20the%20start%20of%20production

220 Lisovsky, N. N., Gogonenkov, G. N., & Petzoukha, Y. A. (1992). The Tengiz Oil Field in the Pre-Caspian Basin of Kazakhstan (Former USSR)--Supergiant of the 1980s: Chapter 7.

221 Johnston, D., & Johnston, D. (2001). Kashagan and Tengiz-Castor and Pollux. Petroleum Accounting and Financial Management Journal, 20(3), 95–119.

222 Chevron.com. (n.d.). Tengiz expansion supersizing the output of a supergiant field. Retrieved April 28, 2023, from http://web.archive.org/web/20210221230914/https://www.chevron.com/projects/tengiz-expansion

223 Spglobal.com. (September 9, 2020). Kazakhstan's Tengiz output drops 100,000 b/d in Q2, 12% on year, on OPEC+ cuts. Retrieved April 28, 2023, from http://web.archive.org/web/20201023042753/https://www.spglobal.com/platts/en/market-insights/latest-news/oil/090920-kazakhstans-tengiz-output-drops-100000-bd-in-q2-12-on-year-on-opec-cuts

224 Caspianbarrel.org. (2024, January 22). Tengiz, Karachaganak and Kashagan retain oil production plans for 2024. Retrieved March 08, 2024, from https://caspianbarrel.org/en/2024/01/tengiz-karachaganak-and-kashagan-retain-oil-production-plans-for-2024/

225 Spglobal.com. (September 9, 2020).

one of the highest in the world. Moreover, the most bottomless high-pressure well is also located in the Tengiz field.[226]

The oil and gas field contains wealthy oil reserves and significant sulfur reserves, estimated within the limits of 4.5 mt. Besides, the Tengiz field has a substantial amount of gas reserves. In its turn, the extracted gas consists of a considerable portion of compound hydrogen sulfide, or H2S.[227]

TCO was created due to the agreement between Chevron and Kazakhstan's government on 6 April 1993. The contract was signed for 40 years. According to the agreement's conditions, the Kazakh government acquired 25%, ExxonMobil Kazakhstan Ventures Inc. 25%, and Chevron 50% shares, respectively.[228] The leading oil company of Russia-AO, Lukoil Holding, announced its readiness to acquire 5% of the Tengiz oil venture field from Chevron in 1997. However, the terms of the contract were not disclosed. According to James Bunch, a Russian oil and gas expert at Renaissance Capital, Lukoil's presence in the project may have given Chevron an extra advantage to settle a pipeline issue.[229]

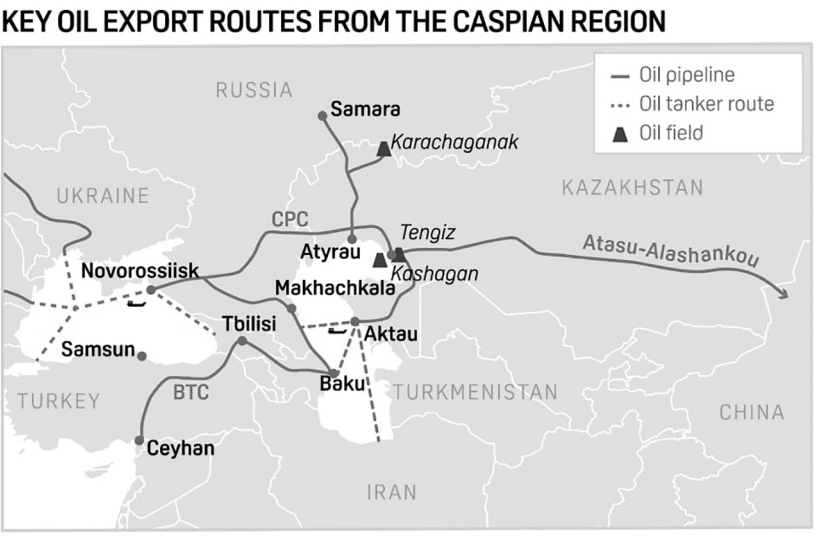
226 Sptimes.ru. (October 23, 2001). Kazakhstan Field's riches come with a price. Retrieved April 28, 2023, from http://web.archive.org/web/20131228125654/www.sptimes.ru/index.php?action_id=2&story_id=5705

227 Sptimes.ru. (October 23, 2001).

228 Petrocouncil.kz. (August 21, 2019). TCO spent more than USD 2.1 billion on the procurement of goods and services from Kazakhstani suppliers in 2019. Retrieved April 28, 2023, from http://web.archive.org/web/20190909074443/http://petrocouncil.kz/en/tco-spent-more-than-usd-2-1-billion-on-the-procurement-of-goods-and-services-from-kazakhstani-suppliers-in-2019/

229 Latimes.com. (January 17, 1997). Russia's Lukoil buys 5% of Chevron project. Retrieved April 28, 2023, from https://www.latimes.com/archives/la-xpm-1997-01-17-fi-19405-story.html

Map 16: Tengiz field[230]



Source: S&P Global Platts

"They're so desperate that they ship crude oil by railroad car to Finland. They'd much rather put it in the pipeline if they could," Bunch said.[231]

The current member companies of the project and their shares:[232]

- Chevron 50%
- ExxonMobil 25%
- KazMunayGaz 20%
- LukArco 5%

5.9.1 Expansion

The Kazakh government and member companies of the Tengiz project created a strategic plan to boost production in the field, producing over a third of Kazakhstan's

230 https://www.spglobal.com

231 Ibid.

232 Tengizchevroil.com. (n.d.). History and Ownership. Retrieved April 28, 2023, from http://web.archive.org/web/20200830175521/http://www.tengizchevroil.com/en/about/overview

total oil production and the second-largest oil producer of the Post-Soviet Region after Russia.[233]

Therefore, according to the Energy Ministry of Kazakhstan, the volume of production from the Tengiz field would grow from 27 up to 39 mt annually or 850.000 bpd by 2022 in accordance with the plan. The Kazakh government has some high hopes concerning the oil and gas field's expansion, so the energy minister of the country, Kanat Bozumbayev, characterized the development of the reservoir as a significant opportunity not only for the energy branch of Kazakhstan but also for Kazakhstan in general.[234] Consequently, the project's expansion would create over 20.000 jobs in Kazakhstan's energy sector, according to the Minister of Labor and Social. The TCO LLP approbated a $36.8 bn. budget regarding the implementation of a production boost.[235]

It is planned to increase oil production up to 12 mt annually or 260.000 bpd by using the Future Growth Project and Wellhead Pressure Management Project (FGP-WPMP) by TCO LLP is an operator of the project.[236] For boosting oil production in the field is implemented a sour gas injection technology by the FGP. In its turn, the WPMP will keep the flowing wellhead pressure and increase the pressure to process the pool trains.[237]

The project can be characterized as the most significant project in the world in the last year, considering private enterprises invested essential capital in expanding the field. For instance, even the capital invested ($28 bn.) by BP to expand the SD natural gas field in Azerbaijan, Total and Novatek's ($26.9 bn.) Yamal LNG plant in Russia is less than the capital invested in developing the Tengiz field. Therefore, the expansion of the area is compared with the Shaybah and Khurais reservoirs of Saudi Arabia.[238]

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233 Reuters.com. (July 5, 2016). Kazakhs, Chevron-led group approve $37 billion Tengiz field expansion. Retrieved April 28, 2023, from http://web.archive.org/web/20190825015653/https://www.reuters.com/article/us-chevron-kazakhstan-iduskcn0zl0x4

234 Reuters.com. (July 5, 2016). 1060 Oilprice.com. (January 30, 2017). Kazakhstan's Tengiz oil field expansion to create 20.000 jobs. Retrieved April 28, 2023, from http://web.archive.org/web/20201001185356/https://oilprice.com/latest-energy-news/world-news/kazakhstans-tengiz-oil-field-expansion-to-create-20000-jobs.html

235 Ft.com. (July 5, 2016). Chevron approves $37bn Kazakhstan oilfield expansion. Retrieved April 28, 2023, from http://web.archive.org/web/20210225103918/https://www.ft.com/content/53bf815a-42a5-11e6-9b66-0712b3873ae1

236 Rigzone.com. (July 11, 2016). TCO awards EPCM support services deal for Tengiz expansion project to KPJV. Retrieved April 28, 2023, from http://web.archive.org/web/20191208045355/https://www.rigzone.com/news/oil_gas/a/145582/tco_awards_epcm_support_services_deal_for_tengiz_expansion_project_to_kpjv/

237 Ft.com. (July 5, 2016).

238 Rigzone.com. (July 11, 2016).

5.10 Karachaganak

One of the most significant oil and gas fields of the last years, the Karachaganak field, is located in the northwest part of Kazakhstan. The entire territory of the area covers over 280km² square. The oil and gas field was explored along the border with Russia, nearly 150 km east of Uralsk. The Uralskneftegasgeologia company discovered the Karachaganak oil and gas field in 1979, still in the time of the SU.[239]

Map 17: Karachaganak field[240]

The oil and gas field possesses a significant energy potential, so the reservoir has about 1200 mt of oil and condensate and over 1.35 tcm. Kazakhstan gets 45% of

239 Francesconi, A., Bigoni, F., Albertini, C., Cominelli, A., Catalani, C., Tarantini, V., & Imagambetov, K. (2012, January). Integrated reservoir studies, Karachaganak field, Republic of Kazakhstan. In SPE Europec/EAGE Annual Conference. Society of Petroleum Engineers.

240 https://www.springer.com

its total gas need from this field. Moreover, nearly 16% of the country's total liquids production is produced by the Karachaganak field.[241]

The steppes cover the reservoir's territory, and it has a harsh continental climate, so the spring is very short, the summer is sweltering, and the winter is freezing here. The highest temperature was observed in summer at +44C (average +26.48C). However, the temperature can fall up to -43 C (average -16.48 C) in winter.[242]

5.10.1 Important contracts and member companies

The Karachaganak field was made a pilot project in 1984, and KarachaganakGazprom, a subsidiary of Gazprom, became an operator of the reservoir. In Soviet times, Karachaganak Gazprom operated the field, while Kazakhgas became a new operator after establishing Kazakhstan's independence. A so-called "contractor group" in 1992, which Agip and BG formed, was created. The Production-Sharing Principles Agreement (PSPA) was concluded between Agip, BG, and Gazprom in March 1995.[243]

The Karachaganak project is currently being developed under the Final Production Sharing Agreement (FPSA). The contract was concluded on 18 November 1997 and came into force on 27 January 1998. The contract will cover the next 40 years after signing. Royal Dutch Shell and ENI companies are the joint operators of the project.[244] Energy companies like Texaco and Lukoil became a part of the project in March 1995.

An agreement was signed between the Russian and Kazakh governments in October 2006, so Kazakhstan started to export oil from the Karachaganak field to Orenburg, Russia, as per the contract between the two states.[245] According to the agreement signed between the Karachaganak Petroleum Operating (KPO) consortium and the Kazakh government on 14 December 2011, Kazakhstan got a 10% share for $2 bn. cash and $1 bn. non-cash consideration in the face of the KazMunayGas state energy company.[246]

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241 Eni.com (n.d.). Karachaganak: The onshore field in Kazakhstan. Retrieved April 28, 2023, from http://web.archive.org/web/20210121061911/https://www.eni.com/en-it/operations/kazakhstan-karashaganak.html

242 O'Hearn, T., S. Elliott, and A. Samsonov. "Karachaganak field, northern Pre-Caspian Basin, northwestern Kazakhstan." (2003): 237–250.

243 O'Hearn et.al (2003).

244 KazMunayGas, Delivering in challenging times, Annual Report 2015.

245 Hydrocarbons-technology.com. (n.d.). Karachaganak Gas Condensate Field. Retrieved April 28, 2023, from http://web.archive.org/web/20201021101618/https://www.hydrocarbons-technology.com/projects/karachaganak/

246 Satrapia.com. (June 28, 2012). Agreement between Kazakhstan and KPO becomes effective. Retrieved April 28, 2023, from http://web.archive.org/web/20190330170743/http://gca.satrapia.com/+agreement-between-kazakhstan-and-kpo-becomes-effective

Five energy companies formed KPO BV to manage the development in the field. Therefore, KazMunaiGas has 10% of shares, BG Group and Eni possess 29.25%, while Chevron and Lukoil have 18% and 13.5%, respectively.[247] The field operator is the Karachaganak Project Development Limited (KPDL), located in London, as a support division for KPO.[248]

BJ Services Company, which has been functioning since October 2009, is another member enterprise of the project that provides services like establishing safety and regulation of environmental standards in the field. Meanwhile, Saipem provides the main work in developing the oil and gas field and functions in cooperation with Consolidated Contractors International Company (CCIC), which has been involved in this project since 2000.[249]

5.10.2 Production

The Karachaganak oil and gas field's production started in 1984, 5 years later, after its discovery. The oil output came on stream when Kazakhstan began to supply a modest volume of condensate gas to Russia's Orenburg terminal.

The liquids are used for re-injection into the upper parts of the associated gas. Nearly 67% of the liquid produced from the field is stabilized at the Karachaganak Processing Complex (KPC). Therefore, the produced fluids are further shipped to the western energy markets via the CPC and the Atyrau-Samara pipelines. Then, the non-stabilized liquids and gas not re-entered into deposits are transported to the Russian energy market through the Orenburg terminal.[250]

In the Karachaganak field, the 2M Commercial Development Stage is used. Its implementation aims to produce hydrocarbon liquids and natural gas by drilling new wells and renewing process units for hydrocarbon treatment. The gas production from the Karachaganak field amounted to 2,021 million m^3 in 2020. This production indicator is 8.6% higher than in 2019.[251] Meanwhile, in 2023, the Karachaganak field yielded a total of 12.1 mt, according to Caspian Barrel.[252]

The Karachaganak field possesses a depositional heterogeneity and diagenetic overprint, so there are some discussions and ambiguities about the distribution of the reservoir properties. The hydrocarbon column has almost 1500 m of fluids. It is

247 KazMunayGas. Annual Report 2015.

248 Ramirez, M. A., Casadiego L, E., Spates, M., & Tlekkavylov, A. (2010, January). A New Method to Measure the Excess of H2S Scavenger in the Karachaganak Field. In SPE Caspian Carbonates Technology Conference. Society of Petroleum Engineers.

249 Hydrocarbons-technology.com. (n.d.). Karachaganak Gas Condensate Field.

250 Ibid.

251 KMG.kz. (February 25, 2021). JSC NC KazMunayGas 2020 trading update. Retrieved April 28, 2023, from https://www.kmg.kz/eng/press-centr/press-relizy/?cid=0&rid=353

252 Caspianbarrel.org. (2024, January 22).

considered a different variation in the fluid properties because of the Karachaganak field's thickness. For example, a wet-gas-like initial GOR of 1200 m3/3 at the upper part of the reservoir is one of them. However, since the gas is getting heavier and heavier, an original liquid with a GOR of 300 m3/m3 might be met in the deepest zones.[253]

5.10.3 Development stages

The development of the oil and gas field was realized in two stages. In 2007, an agreement was concluded concerning a gas sale-purchase between KPO and KazRosGaz. Therefore, the first phase's development began with three wells percolating the Permian formations of the reservoir.[254] The peak of oil production with 100,000 bbl/d was achieved in 1990 after implementing more than 200 verticals.[255]

The first stage of the development comprised exploring new, unexplored wells and the development of old ones. Additionally, this stage included building gas treatment facilities and implementing new compressors to boost the gas re-injection amount.[256] Meanwhile, the second phase of the development spans some critical parts of the process, such as the construction and advancement of existing facilities, building injection facilities, and creating 120MW power stations.

The stage's construction was started in 2000, while it came on-stream only four years later, in 2004. The pipeline's development, which reaches 650 km and connects the Karachaganak field to the CPC pipeline at Atyrau, was also realized in this phase.[257] The Kazakh government officially took over the expansion of the third stage in 2012. According to initial estimations, the extension cost should have been almost $14.5bn., and it was expected that the expansion would increase the production of oil to 16 bcm/a.[258]

The Ministry of Energy of Kazakhstan announced in 2016 that $12 bn is needed to expand the crude oil project from the Karachaganak field, so the Kazakh government is going to increase the utilization of liquid stabilization trains with the help of this

253 Francesconi et al. (2012, January).

254 Borromeo, O., Luoni, F., Bigoni, F., Camocino, D., & Francesconi, A. (2010, November). Stratigraphic architecture of the early Carboniferous reservoir in Karachaganak field, Pri-Caspian basin (Kazakhstan). In SPE Caspian Carbonates Technology Conference. OnePetro.

255 Hydrocarbons-technology.com. (n.d.). Karachaganak Gas Condensate Field.

256 KazMunayGas. Annual Report 2015.

257 Hydrocarbons-technology.com. (n.d.). Karachaganak Gas Condensate Field.

258 İbid.

expansion.[259] The reservoir has 48 tcf of gas.[260] However, the development of stage delays because of some technical challenges.

5.11 Galkynysh

The Galkynysh field, which is placed nearly 400km southeast of Ashgabat, is believed to be one of the world's most abundant natural gas fields. The drilling of the natural gas reservoir proved the prospects of the field's growing natural gas capacity. The natural gas field was initially explored in Ýolöten of Turkmenistan's Mary Province in 2006.[261] Ýolöten is characterized by its abundant natural gas reserves and includes some major natural gas fields like South Iolotan, Osman, Minara, and Yashar. However, the Galkynysh gas reservoir is far from the wealthiest natural gas field in the Southern Ýolöten-Osman area, which is close to the border of Turkmenistan with Afghanistan and Iran[262] (see Map 18).

Turkmen geologists claim that there are some significant natural gas reserves in Southern Ýolöten-Osman and Yashlar and that the Gunorta Garakel, Garakel, Giurgiu, Gazanly, Gundogar Eloten, and Gunbatar Yandakly natural gas fields have essential reserves of natural gas. This oil and gas field's total area is over 90 km in length and 30 km in width.[263]

The existence of essential natural gas reserves in Turkmenistan was announced still in 2009. According to the state news agency of Turkmenistan, Turkmen Dovlet Khabarlary, as a result of Turkmen geologists' efforts, Turkmenistan secured its status as the energy power, which can afford a lasting natural gas export to its partner.[264] The former President of Turkmenistan, Gurbanguly Berdimuhamedow, signed a decree on 18 November 2011. According to this decree, Southern

259 Reuters.com. (April 5, 2016). UPDATE 2-Kazakhstan files $1.6 bln claim against BG-Eni venture -Lukoil. Retrieved April 28, 2023, from http://web.archive.org/web/20190822004848/https://www.reuters.com/article/kazakhstan-karachaganak-idusl5n1780u7

260 KPO.kz. (2019). Karachaganak field discovery. Retrieved April 28, 2023, from http://web.archive.org/web/20201205172520/https://www.kpo.kz/en/about-kpo.html

261 Kostianoy, A. G., Zonn, I. S., & Kostianaia, E. A. (2016). Geographic characteristics of the Black-Caspian Seas region. In Oil and Gas Pipelines in the Black-Caspian Seas Region (pp. 7-36). Springer, Cham.

262 Ismayilov, E., & Budak, T. (2014). Bağımsızlık Sonrası Türkmenistan'ın Enerji Politikası. Bilge Strateji, 6(11), 29-49.

263 Trend.az. (June 26, 2009). Turkmenistan discovers large gas fields in east of country. Retrieved April 28, 2023, from http://web.archive.org/web/20150210223202/http://en.trend.az/casia/turkmenistan/1494593.html

264 Trend.az. (June 26, 2009).

Ýolöten-Osman, Minara, and adjacent areas were renamed as "Galkynysh," which is translated from Turkmen as "Revival."[265]

Map 18: Galkynysh natural gas field, Mary province[266]

Galkynysh gas[267] reservoir includes:[268]

- Drilling of several dozen exploitation wells;
- Construction of commercial gas pipelines;
- Four installations for preliminary preparation of gas;
- Three gas desulphurization plants with a total capacity of 30 bn. cubic meters of tank gas per year.

265 Timesca.com. (January 7, 2012). Foreign Ministry of Turkmenistan refutes statement by Vice-Chairman of "Gazprom." Retrieved April 28, 2023, from https://www.timesca.com/index.php/news/10054-foreign-ministry-of-turkmenistan-refutes-statement-by-vice-chairman-of-gazprom

266 https://www.khabarindia.in

267 Litvinenko, V. S., Kozlov, A. V., & Stepanov, V. A. (2017). Hydrocarbon potential of the Ural–African transcontinental oil and gas belt. Journal of Petroleum Exploration and Production Technology, 7(1), 1-9.

268 Bai, G., & Xu, Y. (2014). Giant fields retain dominance in reserves growth. Oil and Gas Journal, 122(2), 44–51.

5.11.1 Development

The national gas company of Turkmenistan, Turkmengaz, is the owner of the field. The development of Galkynysh was launched in 2010 after accomplishing an initial Front-End Engineering and Design (FEED) phase. The development works of Galkynysh included processes:[269]

- Construction of gas treatment and sulfur handling facilities along with well pad facilities,
- Surface gathering facilities,
- Infrastructure and utilities,
- Condensate processing and storage facilities.

The development was realized in phases. With 30 bcm/a of marketable natural gas capacity, the first phase of the field was started in 2013. $9.7 bn dollars was invested in the early stages of development which was achieved by September 2013.[270] This was a loan from the Chinese Development Bank[271] and provided by the Turkmengaz state gas company.[272]

The Gas Processing Plant (GPP) building in the second stage started in 2014. The second phase has the same 30 bcm/a natural gas production capacity. CNPC built the plant, and the Chinese State Development Bank funded the construction of the plant.[273] The final, third stage of Galkynysh, with a production capacity of 35 bcm/a, was launched in 2015. It is expected that the full exploitation of the most prosperous third phase of the reservoir will boost the entire natural gas production up to 95 bcm.[274]

According to Ashyrguly Begliyev, the chairman of the Turkmengas State Concern:[275]

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269 Hydrocarbons-technology.com. (n.d.). Galkynysh Gas Field. Retrieved April 28, 2023, from https://www.hydrocarbons-technology.com/projects/-galkynysh-gas-field-turkmenistan/

270 Reuters.com. China asserts clout in Central Asia with huge Turkmen gas project. (September 4, 2013). Retrieved April 28, 2023, from https://www.reuters.com/article/us-gas-turkmenistan-galkynysh/china-asserts-clout-in-central-asia-with-huge-turkmen-gas-projectidusbre9830mn20130904

271 Rejepova, T. (2013). Turkmenistan, China reach new energy deals. The Central Asia-Caucasus Analyst, October, 16.

272 Olcott, M. B. (2013). Turkmenistan: Real Energy Giant or Eternal Potential?

273 Rejepova (2013).

274 Paramonov, V., & Strokov, A. (2015). China in the Oil and Gas Branch of Turkmenistan. Central Asia and the Caucasus, 16(3-4), 176–185.

275 Azernews.az. (November 27, 2015). Turkmenistan to launch stage 3 of Galkynysh field's development. Retrieved April 28, 2023, from http://web.archive.org/web/20210127112812/https://www.azernews.az/region/90243.html

> "To date, the facilities with a capacity of 30 bn. of marketable gas per year have been commissioned. The second stage of similar capacity was started in 2014, and it is expected that the third stage of resettlement of the Galkynysh gas field with a capacity of 35 bn. cubic meters of marketable gas annually will begin at the end of this year."

Turkmenistan is going to increase the drilling operations at Galkynysh. According to the Oil and Gas Ministry of Turkmenistan, all the field wells show their high productivity. For instance, a single well outputs daily between 60 to 70 mcf of natural gas.[276]

5.11.2 Member companies and their functions

In 2007, the CNPC was awarded by the government of Turkmenistan a contract worth $152 million. The agreement, which meant drilling 12 gas wells at the South Ýolöten field and other Turkmenistan areas, was for three years.[277]

The audition of the field was realized by Gaffney, Cline & Associates (GCA), an international oil and gas consultancy company of the United Kingdom.[278] The Turkmen government authorized GCA to provide an audit of the two largest natural fields in Turkmenistan in 2008.[279] Consequently, taking into account the examination results in the natural gas field, GCA confirmed that the energy reservoir possesses natural gas reserves between 4–14 tcm, which the state news agency of Turkmenistan earlier announced. However, the field's natural gas capacity lies at the level of 6 tcm due to another more realistic estimation.[280]

The Chinese CNPC, South Korean LG International Corp and Hyundai Engineering Co, and the UAE's Petrofac Emirates won the developing natural gas reservoir tender in December 2009. These companies acquired the contracts with the entire worth of $9.7 bn.[281] Consequently, Petrofac ($3.4bn.), a consortium of LGI Interna-

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276 Oilprice.com. (July 18, 2016). Turkmenistan abolishes two energy agencies. Retrieved April 28, 2023, from http://web.archive.org/web/20160926083159/http://oilprice.com/latest-energy-news/world-news/turkmenistan-abolishes-two-energy-agencies.html

277 Reuters.com. (January 20, 2007). Turkmenistan gives CNPC $152 mln gas drilling deal. Retrieved April 28, 2021, from https://www.reuters.com/article/energy-china-turkmenistan-idukl2177633120061121?edition-redirect=uk

278 Liang, M., Zhang, Y., Peng, Y., Sun, L., Ren, Z., Zhang, Q., & Yang, Y. (2020). Turkmenistan's natural gas industry and diversification of exports. Journal of Oil & Gas Storage and Transportation, 2(2), 78-86.

279 Indeo, F. Turkmenistan's Energy Strategy: Aiming to the Diversification of Export Routes.

280 Reuters.com. (October 31, 2008). Turkmen gas reserves audit to continue in 2009 -GCA. Retrieved April 28, 2023, from http://www.reuters.com/article/turkmenistan-gas-reserves-idu slv21594720081031?sp=true

281 Hydrocarbons-technology.com. (n.d.). Galkynysh Gas Field.

tional Corp & Hyundai Engineering ($1.48bn.), and CNPC ($3.13bn.) implemented some crucial processes in the development of the project such as engineering, procurement, construction and commissioning (EPCC). Petrofac Emirates had responsibility for the FEED of the project. The invested capital is estimated at around $100 million. More than 60 contractors and over 14000 employees were involved in developing the project.[282] According to the awarded contract, the South Korean LG International and Hyundai Engineering created a gas plant at South Ýolöten by the second part of 2012.[283]

5.11.3 Galkynysh as the primary natural gas export source of Turkmenistan

The Turkmen government is interested in becoming a significant new natural gas exporter to the European natural gas market and countries like India, Pakistan, etc. The former president of Turkmenistan stressed his country's interest in becoming a stable supplier of energy:[284]

> "My country and the European community, on the whole, are highly interested in stable supplies of hydrocarbons," Berdimuhamedov told reporters, "which Turkmenistan, pursuing the policy of diversification of energy supplies to global markets, is so rich in."

Galkynysh is set to become the resource base for the grand 1127-mile-long TAPI pipeline. Turkmenistan has already begun tube welding on its territory despite many risks associated with pipeline construction.[285] The country's former president has also signed a decree worth $45 million for the development of the pipeline, which demonstrates confidence in the realization of TAPI or a kind of lure for foreign investors rather than an actual investment.[286]

The realization of the natural gas pipeline, which should export natural gas from the Galkynysh natural gas field from Turkmenistan to Afghanistan, Pakistan, and India (see Map 19), has been planned for some years. However, an

282 Reuters.com. (December 29, 2009).

283 Tehrantimes.com. Iran in Turkmen natural gas fields, U.S. and Russia left out. (February 21, 2009). Retrieved April 28, 2023, from https://www.tehrantimes.com/news/189709/Iran-in-Turkmen-natural-gas-fields-U-S-and-Russia-left-out

284 Ibid.

285 Naturalgasworld.com. (June 22, 2016). Siemens could supply compressors for TAPI gas pipeline. Retrieved April 28, 2023, from https://www.naturalgasworld.com/siemens-could-supply-compressors-for-tapi-gas-pipeline-18858

286 Nytimes.com. Afghanistan Breaks Ground on 1,127-Mile Peace Pipeline. (February 23, 2018). Retrieved April 28, 2023, from http://web.archive.org/web/20210308182243/https://www.nytimes.com/2018/02/23/world/asia/afghanistan-pipeline-tapi.html

official approbation of the project happened in December 2015 when the officials of Turkmenistan–Afghanistan–Pakistan–India signed a contract called Turkmenistan–Afghanistan–Pakistan–India natural gas pipeline (TAPI).[287] There are some severe risks, such as the uncertain geopolitical situation in the region. The pipe's expenditure, which should export 33 bcm/y gas to Pakistan and further on to India, is estimated at between $7.6-10 bn.[288]

Map 19: TAPI route[289]

287 Foreignpolicy.com. (February 9, 2016). A Pipeline to South Asia Prosperity. Retrieved April 28, 2023, from http://web.archive.org/web/20201026164059/https://foreignpolicy.com/2016/02/09/a-pipeline-to-south-asia-prosperity/

288 OGJ.com. (December 7, 2015). Turkmenistan positions itself as Eurasian natural gas power. Retrieved April 28, 2023, fromhttp://web.archive.org/web/20190728224437/https://www.ogj.com/pipelines-transportation/article/17236883/turkmenistan-positions-itself-as-eurasian-natural-gas-power

289 https://www.foreignpolicynews.org