The Energy Sector in the Caspian Sea Region: Disappointed Hopes – Uncertain Prospects

Following the collapse of the Soviet Union, not only Russia, but also the newly sovereign states of Azerbaijan, Turkmenistan and Kazakhstan placed great hopes in opening up and exporting the reserves of oil and natural gas located in the Caspian Sea Region. International petroleum companies spoke of the great potential in the region and announced large-scale investment projects. At times the Caspian Sea was described as the "Gulf of the 21st century". These expectations have been no way fulfilled, however. Energy output in the countries mentioned has remained at a low level following the drastic decline at the start of the 1990s. Little is likely to change in this situation over the medium term. The known oil reserves in the Caspian Sea Region are not even as large as those in the North Sea. International legal conflicts, not least the lack of clarity on the legal status of the Caspian Sea, have also reduced the propensity to invest in the region's energy sector. In addition, the problem of export channels remains to be resolved; it is doubtful whether the planned pipeline and tanker routes are economic, and many of them run through politically unstable regions. Low energy prices on global markets are also damaging the prospects of the energy sector in the region. Although foreign investment increased in the course of last year, to judge by the existing problems a major expansion of the energy output of the Caspian Sea Region seems unlikely.

The point of departure: the dramatic decline in energy output following the collapse of the Soviet Union

Under Soviet rule, the exploitation of oil and natural gas resources in the Caspian Sea Region had been run down in favour of the qualitatively superior reserves in western Siberia. Even so, at the end of the 1980s the Republics of Kazakhstan, Turkmenistan and Azerbaijan were able to meet their primary energy needs largely from their own sources. In contrast to many of the other Soviet republics, they were not dependent upon Russian energy supplies, or only with respect to specific energy sources. Indeed, Kazakhstan (oil) and Turkmenistan (natural gas) were able to supply energy to other republics or to export (in net terms) to other countries. Following the collapse of the Soviet Union, energy output fell sharply in all three of the newly founded countries in the course of the transformation process (cf. table 1). Given that consumption fell to a lesser extent, in most cases this meant a decline in net exports. Yet even now the newly sovereign states of Azerbaijan, Kazakhstan and Turkmenistan are scarcely dependent upon energy imports. Kazakhstan and Turkmenistan, in particular, are, however, dependent upon the Russian transport system for their exports to third countries.

Despite the decline in output, Russia remains the largest producer of natural gas in the world, with an output of 570 billion m^3 and the third-largest producer of crude oil with an output of around 306 million tonnes (cf. table 1). In 1997 its net exports of gas and oil amounted to 191 billion m^3 and 178 million tonnes respectively.[1] In Kazakhstan, by the end of 1997 oil output, at 25.7 million tonnes, had reattained the level achieved at the start of the 1990s. Indeed, given lower domestic consumption it was able to expand its oil exports to 16.5 million tonnes (1990: 6 million tonnes). The volume of oil transported via the Russian pipeline network is limited to between 6 and 8 million tonnes per annum,[2] however, so that oil was also transported via Azerbaijan and Georgia to the Black Sea. In Turkmenistan natural gas production fell from almost 90 billion m^3 in 1989 to just 35 billion m^3 in 1997; of this almost two-thirds were exported in 1997 (1990: 70 billion m^3). The decline in output is blamed on both the obsolete production equipment and the limited scope to export gas to customers willing and able to pay. Previously, exports had been transported solely via Russian pipelines.[3] Although in the 19th century Azerbaijan had been a major oil-producing region, today its output is all but insignificant (1997: 9 million tonnes). Since the autumn of 1997 'early oil' has been piped from the Chiraq field by means of the reopened Baku-Novorossiisk (Russia) pipeline, which runs through Chechnya.

Overall, there is no sign of the hoped-for major expansion of output in the Caspian Sea Region. Apart from Russia, the countries in the region produce only relatively small volumes of oil and gas that are of little

[1] In gross terms almost 110 million tonnes of crude oil and 121 billion m^3 of gas were exported to countries outside the former Soviet Union.

[2] Cf. *Petroleum Economist*, January 1997, p. 34.

[3] Since 1995 Russia has no longer transported Turkmenian natural gas to western Europe, but only to the successor states of the Soviet Union, with their much lower effective demand. Faced with debt arrears, at the start of 1997 Turkmenistan refused to export gas to the successor states. So far no agreement has been reached between Turkmenistan and Russia on the purchasing price for Turkmenian gas, transit fees and the transit route.

Table 1
Energy Production, Net Exports and Domestic Consumption, 1990 to 1997[1)]

	1990	1991	1992	1993	1994	1995	1996	1997
				Crude oil (million tonnes)				
Russia								
Production	516.2	461.1	396.4	354.4	317.8	307.0	301.0	305.8
Net export	257.5	186.6	162.6	149.9	165.6	159.4	174.0	178.4
Domestic consumption	258.7	274.6	233.8	204.5	152.2	147.6	127.0	127.4
Kazakhstan								
Production	25.8	26.6	25.8	23.0	20.3	20.5	23.0	25.7
Net export	–1.7	3.9	3.9	7.2	6.3	10.2	16.5	16.5
Domestic consumption	27.5	22.7	21.9	15.8	14.0	10.3	6.5	9.2
Turkmenistan								
Production	5.7	5.4	5.2	4.9	4.4	4.7	4.4	4.5
Net export	2.6	2.1	0.2	0.8	0.7	0.3	0.3	0.3
Domestic consumption	3.1	3.3	5.0	4.1	3.7	4.4	4.1	4.2
Azerbaijan								
Production	12.5	11.7	11.1	10.3	9.6	9.2	9.1	9.0
Net export	3.1	2.5	4.0	2.8	2.1	0.9	1.2	1.5
Domestic consumption	9.5	9.2	7.1	7.5	7.5	8.3	7.9	7.5
				Natural gas (billion m^3)				
Russia								
Production	640.5	643.0	640.4	618.3	607.3	595.0	601.0	570.0
Net export	131.8	103.8	172.0	160.3	174.4	182.2	188.5	190.9
Domestic consumption	508.7	539.2	468.4	458.0	432.9	412.8	412.5	379.1
Kazakhstan								
Production	7.1	7.9	8.1	6.7	4.5	5.9	6.4	6.1
Net export	–5.9	–5.9	–6.0	–4.2	–4.4	–4.4	–4.5	–4.5
Domestic consumption	13.0	13.8	14.1	10.9	8.9	10.3	10.9	10.6
Turkmenistan								
Production	87.8	84.3	60.1	65.3	35.7	32.3	35.2	35.0
Net export	71.9	70.0	51.8	48.1	27.2	25.7	24.0	23.0
Domestic consumption	15.9	14.3	8.3	17.2	8.5	6.6	11.2	12.0
Azerbaijan								
Production	9.9	8.6	7.9	6.8	6.4	6.6	6.3	6.3
Net export	–8.4	–8.4	–3.8	–2.3	–2.0	0.0	0.0	0.0
Domestic consumption	18.3	17.0	11.7	9.1	8.4	6.6	6.3	6.3

1) Excluding changes in inventories.
Source: DIW databank on East European energy.

relevance for international markets. On the other hand, in the countries mentioned the energy sector has an importance for the national economy that goes far beyond meeting domestic energy needs: it is the most important industrial branch. In 1996 it accounted for more than two-thirds of industrial output in Azerbaijan, for more than 55% in Turkmenistan, more than 40% in Kazakhstan and almost 30% in Russia. Energy exports (including electricity and coal) generated more than 46% (1997) of export revenues in Russia and one-third (1996) in Kazakhstan.[4] Exports of natural gas generated around 60% (1996) of Turkmenistan's export earnings in convertible currencies.[5]

[4] *Kazakhstan Economic Trends,* Quarterly Issue (July – September), 1997, p. 128.

The resource question: is the Caspian Sea Region really the Gulf of the 21st century?

Estimates of the size of the petroleum and natural gas deposits in the Caspian Sea Region differ widely. Normally the figures for the region refer to the reserves thought to exist in Russia, Kazakhstan, Turkmenistan, Azerbaijan and Iran.[6] The crude oil reserves in the region classified as "proven" amount to between 2 and 4 billion tonnes; known natural gas reserves are put at between 4.5 and 7 trillion m^3; on top of this come between 23 and 28 billion tonnes of oil and approximately 8 trillion m^3 of natural gas *thought* to be deposited in the region.[7] Thus, in terms of known resources, the region accounts for only around 2% of global oil and between 3% and 5% of the world's natural gas reserves. The Caspian Sea is not therefore, as is often claimed, the "Gulf of the 21st century". The oil reserves are not even as large as those in the North Sea, and gas deposits are only slightly more important.

Only rough estimates are available on the distribution of resources across the various countries and on existing development projects. Yet it is clear that for both Russia and Iran the reserves located in the region are of only secondary importance. Russia is supposed to have known resources in the Caspian Sea Region totalling around one billion tonnes of oil; this amounts to around one-seventh of its total known reserves. In the Caspian Region of Iran less than two billion tonnes of oil may be deposited, whereas the country's total known reserves amount to around 13 billion tonnes. Of the known reserves in the Caspian Sea Region Kazakhstan accounts for around 1.5 to 2 billion tonnes of oil and 1.5 to 2.3 trillion m^3 of natural gas. The most important deposits in Kazakhstan are the Tengiz[8] and Karachaganak[9] fields and the offshore deposits in the northern part of the Caspian Sea, east of the mouth of the Volga. From 2004 onwards it is planned to expand oil production to reach an output level of 160 million tonnes, whereby output from the Caspian Sea is to be increased to 5 million tonnes by the year 2004 and to between 50 and 60 million tonnes per annum by the year 2014. Around half of the known reserves of natural gas are located in Turkmenistan. Relatively large deposits have been found in the east of the country in the Amu Darya and Murgab basins. Of the offshore reserves in the Caspian Sea, Turkmenistan regards, amongst others, the Serdar and Azeri fields and parts of the Chiraq fields as its property. The programme to develop the oil and natural gas sector adopted in 1993 envisages substantial increases in output within a very short period of time. Natural gas production, for example, is to increase to 130 billion m^3 by the year 2000; that would be quadruple the current level of output. Oil output is planned to increase by as much as a factor of seven (28 million tonnes).[10] At some point maximum output levels of 80 million tonnes of oil and 230 billion m^3 of gas up to be achieved. Such production targets appear unrealistic. Azerbaijan has proven oil reserves of around 1 billion tonnes. By the year 2010 annual output is to reach around 47 million tonnes. Natural gas production is to expand by more than 10 billion m^3 to 16.5 billion m^3, enabling natural gas to be exported in future.[11] It must be questioned whether such ambitious production targets can be achieved. Given that, in addition to Turkmenistan, Azerbaijan claims that the Serdar oil field (which it calls the Kyapaz field) and the Azeri and Chiraq fields are located on its territory, any further expansion of output will be contingent on a resolution of the disputes over property rights in the Caspian Sea.

The property question: Caspian Sea or Caspian Lake?

As long as the Soviet Union existed, the legal status of the Caspian Sea was determined by two treaties signed between the USSR and Persia in 1921 and 1940.[12]

[5] European Bank for Reconstruction and Development, *Transition Report Update*, April 1997, p. 57.

[6] In some cases the figures also include deposits in Uzbekistan, which does not border on the Caspian Sea. Uzbekistan has only very limited oil reserves and known natural gas reserves of around 2 trillion m^3. Cf. US Energy Information Administration, Caspian Sea Region, October 1997 (www.eia.doe.gov/emeu/cabs/caspian.html)

[7] Cf. *The Economist,* 7 February 1998, p. 5 f.; US Energy Information Administration, Caspian Sea Region, op. cit.

[8] Tengiz is considered to be the largest untapped oil-field in the world. Around one billion tonnes of oil are thought to be economically exploitable. Cf. M. J. Sagers, The Oil Industry in the Southern-Tier Former Soviet Republics, *Post-Soviet Geography*, 35/5, p. 275.

[9] The Karachaganak field is an extension of the Russian Orenburg deposits. Until now all of the natural gas produced on Kazakh territory has been exported to Orenburg.

[10] By 2004 output of 60 million tonnes of oil and 200 billion m^3 of gas is planned. Cf. M. J. Sagers, The Oil Industry in the Southern-Tier Former Soviet Republics, *Post-Soviet Geography*, 35/5, p. 293.

[11] Cf. United Nations Commission for Europe, Economic Survey of Europe, No. 1, New York and Geneva 1998, p. 182.

[12] The treaties dealt merely with fishing and shipping questions; it was also stipulated that no other countries could lay claim to rights to the Caspian Sea. No distribution of resources was undertaken, however. The USSR took as the border to Iran a line running between Astara (now in Azerbaijan) and Gasan-Kuly (now Turkmenistan), and considered that part of the Sea north of this line to be Soviet territory. Cf. concerning property question, Henn-Jüri Uibopuu: Das Kaspische Meer und das Völkerrecht, in: Recht in Ost und West, 39/7, p. 201 ff; Friedemann Müller: Die Region des Kaspischen Meeres Energiereichtum und Geopolitik, in: Osteuropa-Wirtschaft, 41/3, p. 272 f.

Within the Union the Sea was subject to Union law, and the sub-republics had no competences in this area. Following the dissolution of the Soviet Union, the question arose as to the distribution of the rights to the waterways and the underground resources among the new sovereign countries bordering on it. In part this depends on whether the Caspian Sea is considered to be an open sea or a land-locked lake. In the case of lakes, the condominium (joint rule) principal may be applied. If, on the other hand, the Caspian Sea is considered as an open sea, the international Convention on Maritime Law would suggest a division of rights to the waters and underground resources on the equidistance principle.[13]

The conflict over property rights in the region broke out in the autumn of 1994.[14] At this point Russia propounded the view that the Caspian Sea was a land-locked lake, and that therefore the condominium principle was to be applied. The reason for this was that none of the known oil fields would be on Russian territory if the rights to the Caspian Sea were divided up.[15] Kazakhstan, on the other hand, took the view that the Caspian Sea was an open sea and should therefore be divided up according to the equidistance principle. In the spring of 1998 Russia, which up to that point had not been willing to compromise, conceded ground. At the end of April a bilateral agreement was signed between Russia and Kazakhstan under which the sea bed was divided up, while the waters continued to be used in common. Although of itself this is a decisive step towards a resolution of property disputes, the compromise reached between Russia and Kazakhstan has not been endorsed by the other countries involved.[16] In particular, Iran, which wants to implement the condominium principle initially propagated by Russia, refuses to join the bilateral treaty between Russia and Kazakhstan and is insisting on an agreement between all five countries.[17] It may well be that the position adopted by Iran will at the end of the day torpedo the compromise recently reached, one that was seen by many as a breakthrough in the resolution of the property dispute.

It is evident that the often laborious negotiations over the rights to energy reserves in the Caspian Sea reflect interests that go beyond the mere question of property rights itself. Although Russia would gain certain advantages if it became co-owner of the Caspian reserves, given its other resources it is in no hurry to reach agreement on property rights. Consequently, for an extended period Russia was able to adopt an uncompromising stands and thus block agreement on the legal status of the Caspian Sea. This led to a significant loss of time for the other states involved, and has prevented them realising the positive economic effects they had hoped to derive, not least during the transition phase, from a forced exploitation of the region's resources.

The transport question: which routes, how far, where to?

The exploitation of additional oil and gas deposits in the region is conditional on a significant proportion of the energy being exported to third countries, particularly to western and eastern Europe and Asia. This, in turn, requires an expansion of existing transport capacities. Given their one-sided dependence on Russia's pipeline network, a number of countries have an interest in building alternative routes to transit through Russia. However, some of the routes under discussion run through crisis-hit regions such as Chechnya and Kurdistan.

So far greater progress has been made with the oil projects than with gas-related projects. Conclusive decisions have yet to be taken on the routes to be built for transporting crude oil (see Box and figure 1).

Most of the gas-related projects take Turkmenistan, the richest country in gas deposits in the Caspian Sea Region, as their point of departure. Given that the issue of transit remains unresolved between Russia and Turkmenistan, many of the projects aim to transport Turkmenian gas, circumventing the Russian pipeline network. At the same time Russia is seeking to maintain its position as a supplier to important gas markets or – as

[13] The 1982 Convention regulates, in addition to sovereignty over costal waters (up to 12 nautical miles), an exclusive economic zone (220-mile zone); however, the Caspian Sea is only around 200 nautical miles wide.

[14] The spark that set off the conflict was the conclusion of a contract on the exploitation of offshore oil reserves between Azerbaijan, a western consortium and the Russian oil company Lukoil.This led to a Russian intervention, Russia arguing, with reference to the Russian-Persian treaties that no single country was able to exploit Caspian resources without general agreement with other neighbouring countries.

[15] In October 1994 Russia officially justified its view that the Caspian Sea was a land-locked lake before the United Nations with the lack of a connection to the High Seas. As late as the end of 1996 Russia proposed extending the coastal zone from 10 to 45 miles and beyond this zone to exploit the Caspian Sea jointly.

[16] Initially Turkmenistan lent its support to the Kazakh position, but then provisionally adopted the Russian proposal for a 45-mile coastal zone. In the wake of a contract, signed in July 1997, but annulled shortly after, by Azerbaijan and Russia on the exploitation of the Serdar field, which lies 180 km from Baku, but just 100 km from the Turkmenian coast, Turkmenistan was once again keen to take up the Kazakh proposal. Azerbaijan supports the original Kazakh proposal for a division of sea bed and waters, and has therefore not directly joined the agreement between Russia and Kazakhstan.

[17] RFE/RL Newsline, 27 April 1997.

Oil Pipelines

1. Kazakhstan-Russia (CPC Pipeline)

a) *Tengiz-Atyrau-Novorossiisk.* The already existing section of pipeline between Tengiz (Kazakhstan) and Komsomol'skaja (Russia) is to be extended via Tichoreck to the Black Sea port of Novorossiisk. The extension will cost around US-$ 2.5 billion. It is to attain a capacity of 67 million tonnes per annum. The first oil is supposed to flow of through this pipeline, which will be around 1 500 kilometres long, in the year 2000; at its destination it will be pumped onto tankers and transported through the Bosphorus. The plan to transport large quantities of crude oil through the narrow Bosphorus has been criticised by Turkey, although free passage through the Bosphorus is in principle guaranteed by the Treaty of Montreux of 1936.

b) *Tengiz-Atyrau-Samara.* There are plans to reconstruct this pipeline, which is in stage of repair, and to increase its capacity from 6 to 15 million tonnes per annum. Because not all of the crude oil produced in Kazakhstan can enter the Russian pipeline network via Samara, transport by tanker across the Black Sea will remain necessary.

2. Azerbaijan-Black Sea/Mediterranean (AOIC Main Export Pipeline (MEP)).

a) *Baku-Grozny-Novorossiisk (AOIC Northern Oil Pipeline).* This 1 400 km long pipeline was reconstructed for around US-$ 55 million and reopened at the end of 1997. From 2002 around 5 million tonnes of crude oil are to be pumped from Baku to the Russian Black Sea port of Novorossiisk per year. A 153 km long section of the pipeline is on Chechen territory. After disagreement about transit fees, in the spring of 1998 Chechnya threatened Russia with a transit stop. This fact, alongside the need to increase capacity, has caused Russia to construct a pipeline through Dagestan, circumventing Chechnya.

b) *Baku-Supsa (AOIC Western Oil Pipeline, Variant 1).* So far only individual sections of the planned 900 km long pipeline have been built; it is planned to pump 5 million tonnes of crude oil per annum to the Georgian Black Sea port of Supsa. The pipeline is to be finished, including the necessary repair work, in the autumn of 1998. However, at around US-$ 590 million, the costs of the repairs completed to date already amount to twice the sum originally planned. It must therefore be doubted whether, after completion, the capacity of the pipeline will be increased or whether the Baku-Ceyhan route will be constructed.

c) *Baku-Ceyhan (AOIC Western Oil Pipeline, Variant 2).* This pipeline is initially to follow the Baku-Supsa route, but then to cross Georgian territory into Turkey, and subsequently be extended across Kurdish territory to the Mediterranean port of Ceyhan (approx. 1 730 km). It is planned to attain a capacity of 45 million tonnes per annum. Total costs are put at around US-$ 2.5 billion. Although this solution is more expensive than the Baku-Supsa route, it has the advantage of avoiding the bottleneck of the Bosphorus. Support for the construction of this pipeline has come not only from Azerbaijan, Georgia and Turkey, but also from the USA.[1]

3. Tanker transport across the Black Sea, avoiding the Bosphorus

In order to avoid transporting oil through the Bosphorus, plans to ship oil across the Black Sea to the ports of Burgas in Bulgaria, Odessa in the Ukraine, and Samsun in Turkey have been discussed. Also conceivable is tanker transport from Georgia to Constanta in Romania. From each port the oil is to be transported by pipeline as follows.

a) *Burgas-Alexandroupolis.* A bilateral declaration of intent exists for the construction of a pipeline from the Bulgarian Black Sea coast to Greece. Construction costs are estimated at between US-$ 650 and 750 million. Capacity is planned to reach 30 to 40 million tonnes per annum.

b) *Odessa-Brody.* The Ukraine has offered to transport Caspian oil along a 670 km long pipeline from the Black Sea port of Odessa to Brody in western Ukraine. Discussions are under way on whether to build the pipeline and an oil terminal in Odessa.

c) *Samsun-Ceyhan.* Turkey has proposed the construction of a 760 km long pipeline from the Black Sea port of Samsum to the Mediterranean port of Ceyhan. Given the need to transport the oil by tanker across the Black Sea and the repeated loading and unloading this requires, it is doubtful whether the projects are economical. Russia is in favour of these tanker-based plans, and is pushing for the construction/extension of the pipelines mentioned in order to avoid losing its central role as a transit country. Georgia, which itself has very few energy resources, hopes to generate revenue from transit fees if the projects are implemented. However, both the need to ship oil across the Black Sea and through the Bosphorus would be avoided if the Baku-Ceyhan route were constructed. Discussions are under way on linking this western route via Ceyhan to underwater pipelines through the Caspian Sea, establishing a direct link to the oil fields in Kazakhstan and Turkmenistan.

4. Trans-Caspian Pipelines

a) *Aktau-Baku.* There are plans to extend the pipeline already existing between Tengiz and Uzen to the port of Aktau on the Caspian Sea, in order to promote exports of Caspian oil, especially from the Tengiz fields, to the West. From there the oil is to be transported via underwater pipeline to Baku, and from there possibly to Ceyhan.

b) *Turkmenbashi-Baku.* This planned underwater pipeline linking the coasts of Turkmenistan and Azerbaijan could be constructed in addition to the Aktau-Baku pipeline. It is also conceivable, however, to extend the Kazakh section to Uzen in Turkmenistan.

Oil Pipelines continued

The pipelines are to attain a capacity of around 25 million tonnes per annum. The costs are put at around US-$ 2.5 billion. This makes the route through the Caspian Sea to Baku and the extensions to Ceyhan much more expensive than other routes. In addition, the construction of Trans-Caspian pipelines is conditional on a resolution of the disputes over property rights. Iran has voiced opposition to the construction of Trans-Caspian pipelines - with reference to ecological problems - and instead proposed transit across its territory.

5. Kazakhstan-Turkmenistan-Iran (Persian Gulf) (KTI Pipeline)

(Tengiz-)Turkmenbashi-Kharg Island. The construction of a pipeline from Turkmenistan to Iran and on to the Persian Gulf (around 1 500 km) has been envisaged. At a capacity of around 15 million tonnes per annum, the pipeline would cost around US-$ 1.5 billion. If the connecting piece between Uzen and Turkmenbashi were built, Kazakh oil could also be pumped from Tengiz via Uzen and Turkmenbashi to the Persian Gulf (so-called KTI Pipeline).

6. Turkmenistan-Afghanistan-Pakistan

Chardzhou-Gwadar. The construction of a pipeline between Chardzhou in eastern Turkmenistan and Gwadar, located west of Karachi on the Arabian Sea, is in the planning phase. The pipeline would cost around US-$ 2.5 billion and would have a capacity of 50 million tonnes per annum. It would be conceivable to extend the pipeline northwards to Uzbekistan. In view of the ongoing crisis in Afghanistan, however, it is astonishing that this pipeline has even reached the planning stage.

7. Kazakhstan-China

Aktyubinsk-Xinjiang. In 1997 plans were put forward for the construction of a 2 850 km long pipeline between Kazakhstan and western China. The costs of construction are estimated at US-$ 3.5 billion. After the planned estimated construction time of five years, around 85 million tonnes of Caspian oil per annum are to be pumped to the Chinese market.

1 An alternative route to Turkey runs from Baku across Armenian territory. Due to the regional conflicts there, this route is seen as problematic. The pipeline could, however, circumvent the Nagorny Karabakh Region to the south and also avoid the Azeri enclave of Nakhichevan, resorting to a route through Iran. The route through Armenia is no longer under discussion.

in the case of Turkey[18] – to improve its position further. A number of the planned gas pipelines follows the same route as oil pipelines that are also being planned, the aim being to reduce costs (see box and figure 2).

Many of the routes for the transport of crude oil and natural gas from the Caspian Sea Region are as yet still in the planning phase. Alongside economic considerations, the countries concerned are also keen to mark out spheres of influence in the geopolitically explosive region around the Caspian Sea. Geopolitical motives have also been the decisive factor determining the composition of the international consortiums set up in recent years to build or modernise transport infrastructure (cf. table 2).[19] In many cases the composition of the consortiums has changed over time.[20] Foreign companies, many of them US-based, have increased their presence in the region. In July 1997 the USA opted not to oppose the construction of the natural gas pipeline from Turkmenistan via Iran to Turkey, in spite of the sanctions imposed upon Iran; since then Iran can be considered a potential transit country. It is in this context that the conciliatory position adopted by Russia in the question of property rights must be seen. It seems that Russia is now less concerned with direct property rights in the Caspian Sea than with the participation of Russian companies in exploiting resources on the territories of other neighbouring states. Russia also wishes to retain the dominant position it has held in terms of energy transport.

[18] Turkey produces very little gas of its own and is dependent on imports. Turkish gas consumption is expected to treble or even quadruple to the year 2010, subsequently reaching between 32 and 52 billion m^3 per annum. Cf. *Financial Times*, 31 March 1998, p. 28.

[19] In the case of the Azerbaijan International Oil Consortium (AIOC), the USA prevented Iranian participation, as originally envisaged by Azerbaijan, and ensured that Turkey was included. Changes in the composition of the existing consortiums cannot be precluded in the future.

[20] A case in point is the Caspian Pipeline Consortium (CPC). At its foundation in 1992 the CPC consisted merely of the states of Russia, Kazakhstan and Oman. One year later the US oil company Chevron reached an agreement with Kazakhstan on the exploitation of the Tengiz field, but did not join the consortium for the construction of the Tengiz-Novorossiisk pipeline, as it considered the stakeholding offered too small. Instead, in 1993 Chevron founded the Tengizchevroil consortium to develop the Tengiz field, although this was only granted a transport capacity for exports of 3 million tonnes per annum by Russia. Consequently the consortium began looking for transport opportunities that circumvented Russia. However, at the end of 1996 Russia, Kazakhstan and Oman reduced their stakeholdings in CPC to 50%. The remaining 50% were divided up among eight companies, including Chevron and the Russian company Rosneft.

Natural Gas Pipelines

1. Turkmenistan-Kazakhstan-Russia-Ukraine

Turkmenbashi-Dauletabad-Aleksandrov Gay-Ukrainian border. Until the end of 1997 this route was the only exports route for Turkmenian gas. The natural gas from the Turkmenian fields of Turkmenbashi and Dauletabad is brought together by tributary pipelines in Turkmenistan and channelled to the main pipeline. Then the gas is normally transported west to the Ukraine border via Aleksandrov Gaj (Russia).

2. Turkmenistan-Iran-Turkey

a) Okarem-Kord Kuy (Turkmenian-Iranian border). The construction of this 200 km long connecting pipeline was decided in July 1995 and completed at the end of 1997. The construction costs were put at US-$ 190 million. Initially Turkmenistan is to supply 2 billion m^3 per annum to Iran. Capacity is to be increased to 12 billion m^3 per annum. Iran has offered to pay US-$ 40 per m^3 for Turkmenian gas; this is more than Russia is currently offering.

b) Shatlyk field-Iran-Dogubayazit (Iranian-Turkish border). At the end of 1997 it was decided to construct a connection between the Shatlyk natural gas field in eastern Turkmenistan and Turkey via Iran. It is planned to transport the gas from Turkey to western Europe via Bulgaria. To this end the existing network of pipelines in Iran and Turkey need to be extended. On completion the pipeline will be around 2 200 km long and will have a capacity of around 28 billion m^3 per annum. The pipeline is to cost more than US-$ 3 billion. Although the Turkmenistan-Iran-Turkey route was controversial, given US sanctions against Iran, in the event the USA did not block construction of the pipeline. Iran can, however, be circumvented by means of a Trans-Caspian pipeline.

3. Trans-Caspian Pipeline

Turkmenbashi-Baku-Ceyhan. This gas pipeline runs alongside the proposed route of the Trans-Caspian oil pipeline, with an extension via Baku to Ceyhan. The routes through Iran and the Caspian Sea enable Russia to be circumvented. In response Russia has proposed building a pipeline between Russia and Turkey through the Black Sea.

4. Black Sea Pipeline (blue stream pipeline)

Tuapse-Samsum. The construction of an underwater pipeline with a capacity of 16 billion m^3 per annum between the Russian and Turkish Black Sea coasts is in the planning stage. Serious technical problems remain to be solved, however. The direct connection would permit a marked increase in Russian gas supplies (currently 6 billion m^3 per annum). Gas is currently being transmitted via a pipeline from Russia via the Ukraine, Romania and Bulgaria to Turkey. An increase in the capacity of this pipeline is also planned.

5. Turkmenistan-Afghanistan-Pakistan

Alongside the planned oil pipeline, a gas pipeline is to be constructed between Turkmenistan and Pakistan with a capacity of around 20 billion m^3 per annum. Construction costs are estimated at between US-$ 2 and 2.5 billion. This project must be seen in the context of Iranian plans for a gas pipeline from southern Iran to India (almost 2 000 km).

6. Turkmenistan-Uzbekistan-Kazakhstan-China-Japan

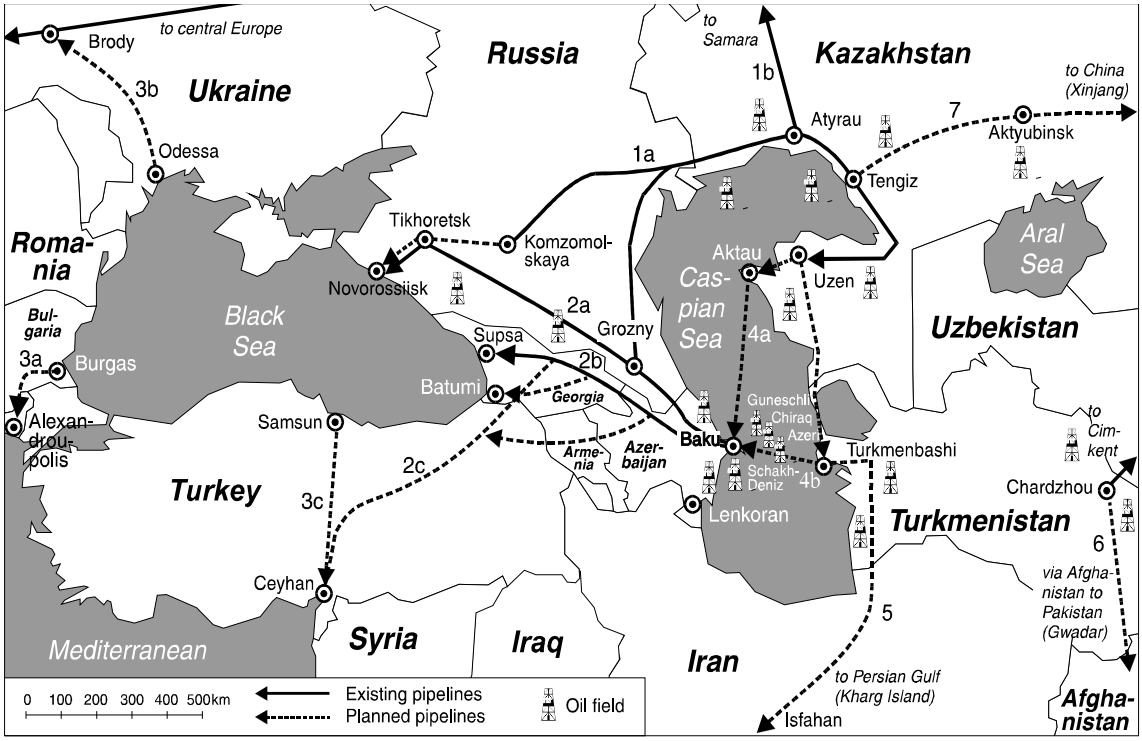
This pipeline is the largest project under consideration for exploiting Caspian natural resources. To China the pipeline would be more than 6 000 kilometres and to Japan around 8 000 kilometres long. A capacity of around 30 billion m^3 per annum is planned; construction costs are estimated at between US-$ 12 and 23 billion.

Beyond the region around the Caspian Sea itself, spheres of influence have also been marked out in those countries that are important for the transit of energy to, for example, Turkey and western Europe; this has involved the founding of new companies and changes in the ownership relations of existing energy companies. This is true, for example, of south-east European countries, such as Bulgaria, which are still heavily dependent on energy supplies from the former Soviet Union, even though they are attempting to diversify their procurement in the longer run. In the case of Bulgaria the Russian gas company, Gazprom, has made further supplies and the conclusion of long-term transit contracts conditional on a complete takeover of the Topenergo transit company, which had previously been partly owned by the Bulgarian state gas company and two private firms.

The economic question: are the reserves competitive internationally?

In order to evaluate the competitiveness of the various oil and gas projects in the region it is necessary to consider the state of global energy markets. The situation on the markets for crude oil is currently (in mid-1998) characterised by excess supply. Falling demand in the wake of the Asian crisis and rising supply (from Iraq

Figure 1
Oil Pipelines



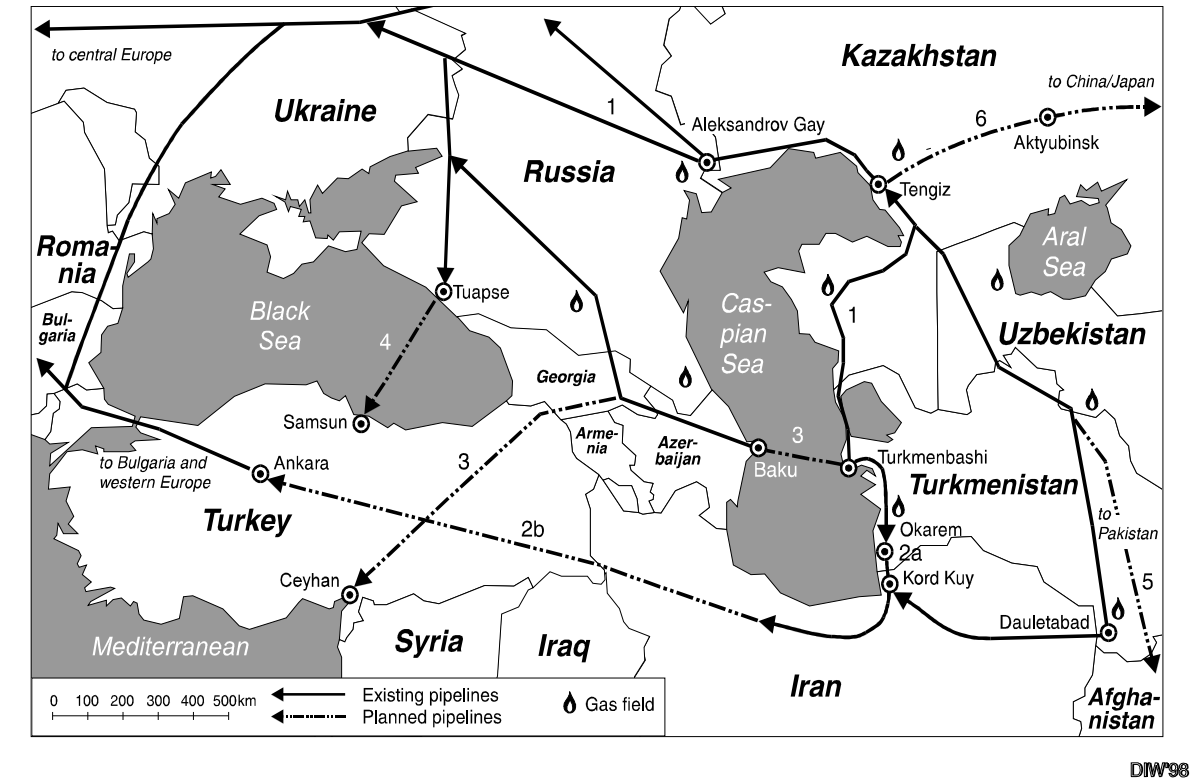
and a number of non-OPEC countries) have led to historically low oil prices. According to the most recent forecasts by Petroleum Economics Ltd, no significant rise in oil prices is to be expected over the medium term.[21] The fall in prices has already driven sections of the Russian oil industry into the red and has destroyed the hopes that the Russian economy might move on to a growth trajectory on the back of primary goods sales. The situation is even more difficult for the countries bordering on the Caspian Sea, for which exports of oil and gas are of far greater relative importance, even though their export volumes are comparatively minor. The production costs of oil fields already in production are likely to be similar to those of Russian deposits, that is between US-$ 5 and 10 per barrel; this is relatively high in international comparative terms.[22] On top of this come the transport and transit costs, which, due to the complex transport routes, are higher than those of other producers with which the region is in competition (e.g. Venezuela, Mexico and Nigeria).

In addition to the pure production costs, the investment costs required to gain access to new deposits are higher in the region than in comparable production locations elsewhere. These investment costs consist of exploration and the construction of the transport infrastructure required. Widely differing figures have been put on the first two costs factors; however, given the relative ease of access of the deposits (close to the surface) and the geological formations in the region, they are unlikely to be higher than elsewhere.[23] The cost of investment in infrastructure, however, does pose a heavy additional burden. Taking an average of different projects, the infrastructure costs are likely to be of the order of between US-$ 3 500 and 7 000 per barrel and

[21] Petroleum Economics Ltd, *Long-term Oil and Energy Outlook to 2015*, London, February 1998, quoted in a comparison of oil-price scenarios in: US Energy Information Administration, *The World Oil Market* (www.eia.doc.gov/oiaf/ieo98/oil.html), Table 14.

[22] IEA, *Oil, Gas and Coal Supply Outlook*, Paris 1996, p. 63. For Kazakhstan total costs, including transport, of between US-$ 90 and 100 per tonne (US-$ 13-14 per barrel) are reported, cf. *Panorama,* 17 April 1998, p. 9.

Figure 2
Gas Pipelines



day.[24] This puts the total investment costs of potential suppliers in the region above those of comparable competitors. Moreover, given that the quantities exported are limited, the Caspian Sea Region cannot play the role, even as a non-member of OPEC, of providing additional capacities in terms of crisis.

The export capacities planned in the region are not of strategic importance for the EU, nor for Germany. The countries of the European Union already meet around 80% of their oil consumption needs from outside the Union. This figure is likely to rise to 90% over the medium term; for Germany an increase in the degree of dependence on oil imports from the current figure of 97% to 99% is expected.[25] Both the EU and Germany already have a highly diversified import structure (Gulf Region, northern and western Africa, Russia), which would not significantly improve with the addition of Caspian oil supplies.

As far as the western European markets are concerned, none of the gas projects offer particularly attractive economic prospects. This is due both to the major investment requirements and the long distances between the Caspian Sea and western European markets, which means higher transport and transit costs. Already the costs of exports from Turkmenistan to the external border of the EU are substantially higher than those of other countries (cf. table 3). The cheapest supplies for Europe are to be found in Algeria and Norway, which border on the EU (US-$ 1.06 to 2.66 per Mbtu).

[23] They are estimated to be US-$ 20 per tonne of known reserves. For the transport of one billion tonnes of known reserves from the Tengiz basin (Kazakhstan), for example, total costs of US-$ 20 billion are given; for the Guneshli field in Azerbaijan investment costs of US-$ 7.8 billion are suggested for 350 to 500 million tonnes, and US-$ 8 billion for all the AIOC fields (around 600 million tonnes). Cf. M.J. Sagers, op.cit. p. 275.

[24] The lowest value is that for the transport route 2c (Baku-Ceyhan), the maximum value for the Kazakhstan-Russia-Bulgaria-Greece pipeline (1a and 3a). By way of comparison: the investment costs for a capacity of one barrel per day are (1996) around US-$ 500 in Iraq, US-$ 2500 in Saudi Arabia and US-$ 5000 in Venezuela; cf. IEA, op. cit., p. 62.

[25] According to a forecast by the European Commission, GD XVII, Energy in Europe to the Year 2020, Brussels 1996.

Table 2

International Consortiums Involved in Pipeline Projects

	Consortium	Field(s)	Pipeline	Foundation/ status
	Oil Pipelines			
1a	CPC (Caspian Pipeline Consortium) Russia 24%, Kazakhstan 19%, Oman 7%, Chevron 15%, Mobil 7.5%, Oryx 1.75%, Lukarco (US-Russian joint venture) 12.5%, British Gas 2%, Agip 2%, Rosneft-Shell 7.5%, Amoco/Kazakoil (US-Kazakh joint venture) 1.75%	Tengiz (Kazakhstan)	Tengiz-Atyrau-Novorossiisk	1992 (since then changing equity holdings: figures refer to 1997)
1b	Agip 32.5%, British Gas 32.5%, Texaco 20%, Lukoil 15% (so far only a Production Sharing Agreement that envisages an increase in pipeline capacity)	Karachaganak (Kazakhstan)	Atyrau-Samara	Nov 1997 Final Production Sharing Agreement
2 (a-c)	AOIC (Azerbaijan International Oil Consortium) BP 17.12%, AMOCO 17.01%, Exxon 8.0%, Unocal 10.05%, Socar 10.0%, Lukoil 10.0%, Statoil 8.57%, Pennzoil 4.82%, Itochu 3.92%, Ramco 2.08%, Delta/Nimir 1.68%, TPAO 6.75%	Azeri, Kyapaz, Chiraq, Guneshli (Caspian Sea)	Main Export Pipeline a) Baku-Grozny-Novorossiisk b) Baku-Supsa c) Baku-Ceyhan	Sept 1994
4a	Amoco Eurasia, KazakOil		Trans-Caspian pipeline (Aktau-Baku)	Under consideration
5	Total, Capex, Opex, KazakOil	Tengiz, Uzen (Kazakhstan)	Kazakhstan-Turkmenistan-Iran	In preparation
6	Unocal, Delta Oil Company, Gazprom, Itochu Corp., Inpex, Hyundai Engineering and Construction Corp., Crescent group	Seidi (Turkmenistan)	Turkmenistan-Afghanistan-Pakistan	Oct 1997
7	KazakOil, China National Oil and Gas Exploration and Production Corporation		Kazakhstan-China	Memorandum of Understanding, Sept 1997, feasibility study
	Natural Gas Pipelines			
2b	Turkmenistan, Royal Dutch/Shell (possible participants: Total, Gaz de France, Ruhrgas)	Shatlyk (Turkmenistan)	Turkmenistan-Iran-Turkey	Memorandum of Understanding, Feb 1998, feasibility study
4	Gazprom, Seipem, Allseas		Russia-Turkey (Black Sea Pipeline)	Project within the framework of the agreement on gas supplies, Dec 1997
5	Unocal, Delta oil Company, Gazprom, Itochu Corp., Inpex, Hyundai Engineering and Construction Corp., Crescent group	Dauletabad (Turkmenistan)	Turkmenistan-Afghanistan-Pakistan	Under discussion since Oct 1997
6	KazTransOil, China National Oil Company, Mitsubishi Corp., Exxon		Kazakhstan-China	Under discussion since Sept 1997

Table 3
Cost of Gas Supplies to Western Europe (in US-$ per Mbtu[1])

Country of origin and transport route	Production costs	Transport costs[2]	Transit costs	Total costs (at EU external border)
Netherlands: Groningen[3]	0.10	0.15	0.00	0.25
Algeria: Transmed-Italy	0.50	0.45	0.11	1.06
Norway: Ekofisk-Emden	1.00	0.34	0.00	1.34
Algeria: Maghreb-Spain	0.50	0.75	0.14	1.39
Norway: Troll-Emden	1.20	0.76	0.00	1.96
UK: Interconnector-Seebrugge	1.50	0.60	0.00	2.10
Russia: Western Siberia-Germany	0.50	1.88	0.84	3.22
Russia: Jamal-Germany[4]	0.75	1.98	0.64	3.37
Turkmenistan: Pipeline through Turkey[4]	0.50	1.88	2.00	4.38
Turkmenistan: Pipeline Russia-Germany	0.50	1.99	2.00	4.49

1) Mbtu = Million British Thermal Unity. 1 Mbtu is equal to 25 kg of crude oil equivalent. — 2) At an internal discount rate of 10%. — 3) Free at the border to the neighbouring country. — 4) In the planning stage.
Source: IEA: Oil, Gas and Coal Supply Outlook, Paris 1996.

Russian gas exports to central and western Europe are already far more expensive at between US-$ 3.22 and 3.37 per Mbtu. All of the Turkmenian gas projects would deliver gas at higher prices than Russian producers (US-$ 4.25 to 4.49 per Mbtu). Even if the cost of production in Turkmenistan can be cut further, a significant cost disadvantage will remain. Contrary to frequent claims by Turkmenistan, this is due not to discrimination by Russia in setting transit prices, but to the longer distances involved (cf. table 3).

The gas reserves in the Caspian Sea Region could be of interest to western Europe as an emergency reserve. Yet even here the small current and potential export volumes are an obstacle.[26] Nor is it a valid argument that western Europe could diversify its energy supply sources by purchasing Caspian gas, as access to such gas is indirect and its supply subject to political risk. Consequently, Caspian oil and gas reserves will not play an important role either in German or in EU energy policy for the foreseeable future. The situation may be rather different for the countries of south-eastern Europe, which remain heavily dependent on Russian energy supplies. Given the lower costs of transport, energy from the region could be of growing importance for countries such as Turkey, Bulgaria, Romania or the Ukraine. At present, though, none of the potential importing countries exhibits sufficiently high demand volumes. Nor do they have adequate investment funds to establish a strong investment presence in the region. Consequently, cooperation in the energy field between the Caspian Sea Region and south-eastern Europe will be restricted to far smaller volumes than those currently under discussion.

[26] Currently the export volume amounts to around 20 billion m^3. By way of comparison, the EU imports 215 billion m^3 and consumes 500 billion m^3.

The Caspian Sea Region: a future EU-neighbour

The hopes of the countries bordering on the Caspian Sea of being quickly able to exploit their crude oil and natural gas reserves have not been fulfilled. The reserves are significantly smaller than the orders of magnitude claimed at the start of the 1990s, and in recent years no significant progress has been made in exploiting them. So far attention has focused on a small number of large-scale projects to develop fields and extend transport. Many of the projects are still in the planning stage. It seems likely that most of the projects will not be realised for economic reasons and due to the political instability of many areas in the region. Economic growth in the countries concerned will therefore not be able to rely on exploiting and exporting energy resources. For western Europe the importance of the Caspian Sea lies neither in

additional supply volumes nor in the diversification of energy supply sources: rather, cooperation with the region is becoming increasingly important, irrespective of the energy sector, in the wake of the eastern enlargement of the European Union.

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