3. Energy reserves, pipeline routes and the legal regime in the Caspian Sea

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I. The energy reserves and production potential of the Caspian

The issue of Caspian energy development has been dominated by four factors.

The first is *uncertain oil prices*. These pose a challenge both to oilfield developers and to the promoters of pipelines. The boom prices of 2000, coupled with supply shortages within the Organization of the Petroleum Exporting Countries (OPEC), have made development of the resources of the Caspian area very attractive. By contrast, when oil prices hovered around the \$10 per barrel level in late 1998 and early 1999, the price downturn threatened not only the viability of some of the more grandiose pipeline projects to carry Caspian oil to the outside world, but also the economics of basic oilfield exploration in the region. While there will be some fly-by-night operators who endeavour to secure swift returns in an era of high prices, the major energy developers, as well as the majority of smaller investors, will continue to predicate total production costs (including carriage to market) not exceeding \$10–12 a barrel.

The second is the *geology and geography of the area*. The importance of its geology was highlighted when two of the first four international consortia formed to look for oil in blocks off Azerbaijan where no wells had previously been drilled pulled out in the wake of poor results.¹ The geography of the area involves the complex problem of export pipeline development and the chickenand-egg question whether lack of pipelines is holding back oil and gas production or vice versa. Suffice it to say that at present both the proposed main export pipeline (MEP) project from Azerbaijan via Georgia to Turkey and actual development at the offshore Azeri–Chirag–deepwater Guneshli (ACG) field complex are continuing to suffer significant delays.

The third factor is the *pipeline issue*. The problem of how to carry Caspian oil to the Black Sea has been cracked; the question how to get it out of the Black Sea has yet to be resolved. In Kazakhstan on 22 November 2000 the Caspian Pipeline Consortium (CPC)² announced that it had completed laying the last stretch of its pipeline from the oil terminal at Atyrau on the northern Caspian in Kazakhstan to the Russian Black Sea port of Novorossiysk.³ The first commer-

¹ See below in this section.

² The members of the CPC are: Russia (24% of the equity); Kazakhstan (19%); the Chevron Caspian Pipeline Consortium Co. (15%); Lukarco BV (12.5%); Rosneft-Shell Caspian Ventures Ltd (7.5%); Mobil Caspian Pipeline Co. (7.5%); Oman (7%); Agip International (NA) NV (2%); BG Overseas Holdings Ltd (2%); Kazakhstan Pipeline Ventures LLC (1.75%); and Oryx Caspian Pipeline LLC (1.75%).

³ Caspian Pipeline Consortium, 'Pipeline system in last lap to completion', Press release, 22 Nov. 2000.

cial deliveries of crude via the new line should be loaded on ship at Novorossiysk around early July 2001. Other oil pipeline projects, notably the proposed Baku–Ceyhan pipeline, remain subject to delay.

Finally, where gas is concerned, the *ability of the Turkish Government to develop a coherent energy import policy* is likely to prove crucial. There may be room for two major pipelines to carry gas to Turkish markets from the former Soviet republics at the same time, but in all probability the start of major construction work on the first new line from the former Soviet republics is likely to mean a postponement of plans to develop a second. It currently looks as if substantial work constructing the technically complex Blue Stream project to bring gas from Russia and Kazakhstan to Turkey via a sub-sea line across the Black Sea has started, while work is proceeding on upgrading existing lines in Azerbaijan for a realistic project to carry smaller volumes of Azerbaijani gas to Turkey as early as 2002, with substantial volumes to flow from about 2005 onwards. A major project to bring large volumes of Turkmen gas to Turkey via a trans-Caspian line that would also transit Azerbaijan and Georgia is foundering in the face of these two projects.

The size of Caspian reserves

The extent of the Caspian Basin's reserve base is still unknown: post-Soviet exploration is only just starting to yield results in terms of proven additions to previously identified reserves of oil and gas. It is, however, possible to make some reasonable estimates that the oil and gas resources of the Caspian region are significantly higher than, and may even be double, those of the North Sea, while falling far short of those in the Persian Gulf—some 40–60 billion barrels (bbl) of oil, or 4–6 per cent of world proven recoverable oil reserves (currently estimated at 1034 bbl), and 10–15 trillion cubic metres (tcm), or 7–10 per cent of world proven recoverable gas reserves (currently estimated at 146 tcm).⁴

Such figures, which represent the contemporary consensus, are in sharp contrast to the hyperbole which has surrounded the issue of the Caspian resource base in recent years. Thus in mid-1997 the US State Department was distributing documentation which cited unnamed analysts as estimating that the region's resource base might contain as much as 200 bbl of 'implicitly' recoverable reserves, the equivalent of almost one-fifth of the world's proven reserves at that time.⁵ At this stage some Russian circles were taking an equally pessimistic view. Russian financial analyst Oleg Timchenko wrote in 1998, following the failure of one Western group to find oil off the Azerbaijan coast, that: 'The moral of this story is that the Caspian is not really a "sea of oil", not every well is going to be successful and there is considerable risk involved in what might appear sometimes to be a low-risk region in which to operate'.⁶ Politics rather than geophysical analysis was probably responsible for both conclusions. The

⁴ BP Statistical Review of World Energy, June 2000.

⁵ US Department of State, Draft memorandum on the Caspian, distributed in May 1997.

⁶ Timchenko, O., 'Russia morning comment', United Financial Group, Dec. 1998.

USA wanted to talk up the opportunities for Caspian hydrocarbon investment; Russia was at that time seeking to play down Caspian prospects.

Since then, things have changed in two key respects. Much more is known about the underlying resource base of the Caspian. There has been at least one major gas discovery in the southern Caspian, off Azerbaijan, and at least one major oil find in the northern Caspian, off Kazakhstan. In addition, Russia appears to have made a significant discovery off its Caspian coast. The international oil market has fluctuated wildly, with very low prices forcing international companies to take a highly cautious approach to the development of Caspian reserves, and more recently relatively high prices encouraging them to find to new ways to bring their produce to market.

However, one underlying factor has not changed. The attractiveness of the Caspian to international companies is not so much a function of its absolute size as of its availability. Caspian reserves may largely be sited in a cluster of countries which are landlocked and which require considerable political ingenuity if output is to be transported to international markets in a cost-effective way; but most are at least potentially available for exploitation on a production-sharing basis by Western companies. The Persian Gulf probably possesses approximately 10–15 times as much oil as the Caspian, but almost all this oil is only available for exploitation by the national oil companies of the host countries. The Caspian is not a new Middle East, and it is not the ultimate panacea for any concerns about long-term global energy supplies, but it is exciting in its own right, attracting a foreign investment programme which over the next 15–20 years will probably average approximately \$4–5 billion a year for exploration, production and transport of the region's oil and gas reserves.

Production plans

The Caspian region's likely production profile changes every year. Actual oil production in the four core Caspian states, Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan, in 1999 totalled just 59.3 million tonnes—equivalent to approximately 1.25 million barrels/day (mb/d) and accounting for some 1.7 per cent of total world output.⁷ Gas production amounted to 88 billion cubic metres (bcm), or 3.8 per cent of total world production.⁸ There are several major programmes already in hand which will increase both oil and gas production substantially, so it is not unrealistic to anticipate a doubling of both oil and gas output by 2010, with further increases to follow. Precise rates of growth remain elusive, because of (*a*) the interaction of production rates and export facilities (the pipeline question); (*b*) erratic political approaches to energy development, notably in Turkmenistan; (*c*) oil price volatility; and (*d*) the fact that production profiles from 2005 on will naturally depend in great part on exploration taking place now and in the next several years.

⁷ BP Statistical Review of World Energy (note 4).

⁸ BP Statistical Review of World Energy (note 4).

Azerbaijan

In April 2000, when Azerbaijan's crude oil output was running at 272 000 barrels/day (b/d), Natiq Aliyev, President of the State Oil Company of the Azerbaijan Republic (SOCAR), spoke in Almaty of raising production to some 60 million tonnes per year (mt/y) (1.2 mb/d) by 2010.⁹ This appeared to reflect an anticipated slowing down in the expansion of production at the giant ACG field complex by the Azerbaijan International Operating Company (AIOC),¹⁰ since in December 1999 he had spoken of oil export volumes ranging from 1.4 to 2.4 mb/d by 2010.¹¹ More important for Azerbaijan's immediate economic prospects is the fact that its total oil production is unlikely to exceed 400 000 b/d, and it seems unlikely that overall output will approach the 1.0 mb/d level before around 2007–2008. This is of considerable significance with regard to the related construction of an MEP to carry large volumes of Azerbaijani oil to European and Mediterranean markets.

As of May 2000, Azerbaijan had signed no fewer than 19 contracts with international companies or consortia to develop specific prospects on a productionsharing basis, and in June 2000 the principles of a 20th accord were agreed. Further agreements were under negotiation in the autumn of 2000. Most of the agreements signed are for offshore development, although four of the confirmed contracts and the remaining unconfirmed deal concern development of onshore fields or prospects. If all 19 confirmed contracts proved successful, they would require an estimated \$50 billion for 13 of the extant offshore contracts and \$4.9 billion for the four confirmed onshore contracts.¹²

However, two projects which, had they proved successful, would have involved investments of several billion dollars have already been dissolved. These were the Pennzoil-led group, which sought to develop the Karabakh prospect, and the Amoco-led group, which secured the concession for the Dan Uludzu prospect. Both groups pulled out after test drilling failed to disclose oil in commercial quantities, although a faint prospect remains that there could yet be a revival of the Dan Uludzu field, since gas was found on-site and development of the nearby Shah Deniz field could make gas production from Dan Uludzu viable on an ancillary basis.

Even though it is now over six years since the AIOC was formed to sign the 'Contract of the Century' for the development of the unitized ACG fields in September 1994, it is still early days in terms of the assessment of post-Soviet additions to Azerbaijan's proven energy reserves. At ACG, the AIOC was, and is, dealing with fields proven in Soviet times. What has been discovered is a

⁹ Natiq Aliev, presentation to the World Economic Forum's Eurasia Economic Summit in Almaty, Apr. 2000. Information on the World Economic Forum can be found at URL http://www.weforum.org>.

¹⁰ As of Mar. 2001, the AIOC comprised: BP (34.1367%); Unocal (10.048%); Lukoil (10%); SOCAR (10%); Statoil (8.5633%); ExxonMobil (8.0006%); Turkish Petroleum (6.75%); Devon Energy (4.8175%); and Itochu (3.9203%).

¹¹ Middle East Energy Report, issue 63 (May 2000).

¹² Spearhead Exhibitions, 'Caspian oil and gas, 2001', URL <http://caspianoilgas.co.uk/brochure.htm>. See also chapter 10 in this volume.

vast gas field—Shah Deniz. While corporate sources at British Petroleum (BP), which operates the field, have been cautious, indicating reserves of about 400 bcm, after success with two test wells Azerbaijani officials from President Heidar Aliyev downwards have proclaimed their belief that the field contains as much as 1 tcm of gas. In any respect, the proven volumes (which BP has yet to incorporate into its own tallies of Azerbaijani and Caspian reserves) were deemed large enough by BP to warrant an immediate start on development of a gas export system to Turkey. The current goal, under a contract signed with Turkey in March 2001, is for exports to start at roughly 2–3 bcm/y in 2004, rising quickly to 6.6 bcm/y in 2007 and to remain at that level until 2015.¹³

Kazakhstan

Two developments have inspired the Kazakh authorities—the discovery of oil at Kashagan in the summer of 2000 and the impending opening of the CPC oil export line from Tengiz to Novorossiysk. Current production is fairly modest. The country's oil and condensate output in 2000 is expected to reach 34 million tonnes (equivalent to 680 000 b/d averaged over the year), reflecting increased production at Tengiz, Karachaganak and a number of lesser fields. By comparison, output in 1999 was 30 million tonnes (600 000 b/d) and in 1998 26 million tonnes (520 000 b/d).

What the leaders of Kazakhstan (and of the other Caspian republics) want is to be producers on a Persian Gulf scale. President Nursultan Nazarbayev declared in April 2000 that output could rise to no less than 400 mt/y (8.0 mb/d) by 2015: 'We think that by 2015 we shall be producing 400 million tonnes of oil a year or about the same as Saudi Arabia'.¹⁴ This was a considerable advance on the previous Kazakh assertion, made by the President of Kazakhoil, Nurlan Balgimbayev, at the summit meeting of Turkic nations in Baku earlier that month, that Kazakh output might reach 200 mt/y (4 mb/d) by 2015.

Nazarbayev was speaking amid intense speculation over the discoveries at Kashagan. The presence of oil and gas was confirmed by Kashagan's operator, the Offshore Kazakhstan International Operating Company (OKIOC), following completion of the field's first well, Kashagan West. Official reports made it clear that a formal declaration of the estimated reserves would have to await completion of a second well, Kashagan East, which would not take place until 2001.¹⁵ The expectation, however, is that the OKIOC is dealing with a truly gigantic field which shares the same structural indications as the nearby giant onshore Tengiz field and may well prove to be even more extensive.

While Nazarbayev's comparison with Saudi Arabia may seem outrageous at first hearing, there is at least a rough logic to his assessment. The three-year seismic programme conducted by the OKIOC and its forebears in the mid-

¹³ East European Energy Report, issue 115 (Mar. 2001).

¹⁴ President Nursultan Nazarbayev, Address to the World Economic Forum's Eurasia Economic Summit in Almaty, 29 Apr. 2000 (note 9).

¹⁵ Press releases by constituent companies of the OKIOC, issued 24 July 2000.

1990s yielded at least three major prospects, of which Kashagan is simply the most hopeful. It is theoretically possible for Kazakhstan's output to rise to approximately 8.0 mb/d if several conditions obtain. All three major offshore prospects would have to yield output of 1 mb/d, while as much as 2.0 mb/d would have to be forthcoming from the clutch of lesser offshore prospects identified in the seismic survey. Tengiz output would have to proceed on track, or even further, peaking not at 700 000 or 800 000 b/d but, as some have suggested it might, at 1.2 mb/d,¹⁶ while Karachaganak would have to meet its existing target for sustainable production of 700 000–800 000 b/d.

Other existing onshore fields, such as Texaco's North Buzachi or the major fields at Uzen, Mangystau and Aktyubinsk, would have to secure sufficient investment to ensure their recovery so that non-Tengiz onshore production could climb to close to 2.0 mb/d. This is not impossible but remains highly improbable. One important element in considering projected output levels is the Kazakhstan Government's continuing preparedness to force foreign companies to dedicate specific volumes to the home market by means of placing limits on export volumes. Thus in December 1999 the government capped oil exports for 2000 at 22 million tonnes.

Turkmenistan

Turkmenistan's proven reserves are as yet relatively modest. According to BP Amoco, they amount to some 500 million barrels of oil and 2.86 tcm of gas.¹⁷ While the country's oil reserves are relatively small—although useful for a country with only 4.5 million people and low per capita income—its gas reserves are of world class, accounting for about 2.5 per cent of global proven reserves of 141.33 tcm. Turkmen officials themselves say that their country has much more substantial reserves than those currently considered proven according to Western standards. In early 1999 the Ministry of Oil and Gas said that the country possessed some 2.1 billion tonnes (15.3 bbl) of proven oil reserves and 11.5 billion tonnes (84 bbl) of what it termed possible oil reserves. For gas, it listed 4.0 billion tonnes of oil equivalent (btoe) in proven reserves and 17.76 bcm, respectively.¹⁸

Turkmenistan is aiming to produce some 200 000 b/d of oil and gas condensate in 2000, as against 150 000 b/d in 1999. While this is a big increase, and while there are certainly additional reserves waiting to be found and developed, it seems highly unlikely that the government will be able to meet its target, set out in a 10-year economic development programme adopted in July 1999, of expanding oil output to 600 000 b/d by 2010. No one really doubts the country's hydrocarbons potential; the principal doubts all concern the lack of a coherent government policy.

¹⁶ Personal communication to the author by a senior adviser to the President of Kazakhstan.

¹⁷ BP Statistical Review of World Energy (note 4).

¹⁸ See chapter 13 in this volume.

Where gas is concerned, the issue is not so much discovering fresh reserves (although this is to be expected) as exploiting proven deposits. Both Exxon-Mobil and Royal Dutch/Shell remain well placed with regard to both exploration and eventual development, but the timing of actual development (and of specific contracts covering prospective development on a production-sharing basis) remains dependent on the creation or re-establishment of sustained export outlets. In time, ExxonMobil may yet come to play a highly significant role as both potential developer and export facilitator; but its gas ambitions are, at least in large part, focused on export markets to the east and the prospect of a Turkmenistan–China/Japan gas line. Such a line, although the subject of some serious studies by a group including both Exxon and Japan's Mitsubishi, is not likely to materialize for another 10 years or so.

In oil, ExxonMobil naturally looks westwards, since its substantial onshore Turkmen concessions lie close to the Caspian coast. Throughout 2000, Shell was reported to be close to signing a formal agreement for development of major gas deposits in central Turkmenistan, which would serve as the basis for a major export project. In May 2000, the government disclosed that Shell had chosen to develop the Malay block, which Oil and Gas Minister Regepbay Arazov said 'has the potential to produce and export 30 bcm/y'—in other words, enough to meet the entire commitment for gas sales to Turkey and Southern Europe envisaged in the context of the proposed Trans-Caspian Gas Pipeline (TCGP) project.¹⁹

Almost all of what the Ministry of Oil and Gas considers to be the country's 2.1 billion tonnes of oil reserves are found in the Caspian area, as are the 11.5 billion tonnes of what it terms possible reserves. However, only a handful of fields are in fact operational and the country's first offshore round of exploration in 1997–98 was a disaster. The second round, in the spring of 2000, likewise yielded few positive results. A handful of companies are already operating, notably Malaysia's Petronas and Dragon Oil from the United Arab Emirates (UAE)-both offshore-together with ExxonMobil which, with the British company Lasmo, has some significant but geologically complex onshore fields. Together with the Turkmenneft State Oil Company (TMN), which is responsible for all indigenous oil and gas operations in the Caspian region, these producers accounted for the lion's share of Turkmenistan's 1999 oil output of 140 000-150 000 b/d. Some oil is also produced in the Amu Darya Basin of eastern Turkmenistan, which is the responsibility of the Turkmengas State Gas Company (TMG). In 1998, TMG accounted for 13.3 per cent of total oil output of 127 400 b/d.

The development of energy resources in Turkmenistan is held back by doubts about the government's ability to honour contractual agreements. It has been embroiled in two significant disputes with oil companies—with the Netherlands' Larmag in the area now operated by Dragon and, more seriously, with Argentina's Bridas, over development of both oil and gas fields. In part these

¹⁹ East European Energy Report, issue 104 (May 2000).

disputes reflected poor bargaining by Turkmenistan when the agreements were first concluded, so they were extremely generous to the foreign companies, but the bottom line after seven years of wrangling and international court cases is simply that Turkmenistan's word is not necessarily trusted. Only the very big corporations, which might be said to have more to offer Turkmenistan than it has to offer them, can take on the authoritarian policies of President Saparmurat Niyazov. His unwillingness to make or to honour long-term commitments has also had considerable repercussions with regard to the development of export pipelines—another factor which has held back field development.

As of early 2001, however, it appears that Niyazov is pinning his country's hopes on a revival of gas sales to Ukraine, via Russia, rather than on the long-proposed TCGP project aimed at supplying gas to Turkey. The current policy certainly has some merits, since the Russian giant Gazprom is currently short of supplies to meet its own export commitments and has therefore been willing to let Turkmenistan make use of its gas pipeline system (at a price) to supply customers such as Ukraine, with which it has cash payment problems.

In October 2000, the presidents of Turkmenistan and Ukraine reached agreement on the delivery over 14-15 months of 35 bcm of gas, with subsequent increases to take deliveries to 50 bcm/y by 2010.20 However, the agreement does have considerable drawbacks. Just over half of the payment will be by barter and, with Ukraine still owing \$315.5 million for Turkmen gas supplied in the first five months of 1999, the omens for smooth implementation of the contract do not look good. However, Turkmenistan has one important card to play: for once it has the possibility of negotiating for sales of gas either to Russia itself or to hard-cash markets served via Russia as a result of potential Gazprom shortfalls. That President Niyazov himself feels that he is now negotiating with Russia from a position of some strength was evident in comments he made in September 2000, when he said that he was now only interested in supplying Russia with gas under contracts to last for just two or three years, instead of a 30-year agreement which Turkmenistan had previously been seeking. Agence France-Presse quoted Niyazov as saying: 'We will sell gas to Russia but long-term agreements can lead to arguments so we will sell gas for a maximum term of two, three years'.²¹ Turkmenistan had previously, in August 2000, concluded what was termed at the time a preliminary agreement to sell Russia 50 bcm/y for 30 years, with provision also for onward delivery of projected gas supplies to Ukraine.

Uzbekistan

Uzbekistan enjoyed the most integrated economy of the Central Asian republics in Soviet times and in the first years of independence was able to make good

²⁰ Synovitz, R., 'Ukraine: gas deal with Turkmenistan reveals Russian influence', 4 Oct. 2000, Radio Free Europe/Radio Liberty, 5 Oct. 2000, URL http://www.rferl.org/nca/features/2000/10/05102000190034.asp.

²¹ East European Energy Report, issue 109 (Oct. 2000).

use of its indigenous resources, including the technical skills of its population. This, however, was essentially a rationalization of existing resources; there was no accompanying expansion of investment. In energy terms, this meant that both oil and gas production were substantially increased in the 1990s, but the absence of any real economic reform has left the country's energy industry lagging in terms of foreign investment. The government is currently trying to remedy this with its newly introduced 'open doors' policy aimed at encouraging direct foreign investment in Uzbek hydrocarbons.

It will be some time before the results of this change of policy become apparent, and in the absence of more wide-ranging economic reform the outlook is not particularly bright. The (admittedly conservative) BP estimates for the country are that it possesses 0.6 bbl of oil and condensate and 1870 bcm of natural gas. However, the government, citing 'estimates by specialists', in July 2000 sought to attract potential investors by asserting that the country's energy reserves totalled 5.78 billion tonnes (42 bbl) of oil and gas condensate and 5095 bcm of natural gas.²² It did not say whether these were proven recoverable reserves or reserves in place, and much more independent analysis (not to mention seismic survey work and drilling) will be required before such figures can be validated. Nevertheless, even on the BP estimates, Uzbekistan has some 1.3 per cent of proven global gas reserves, making them a world-class resource.

As for production, oil output rose three-fold between 1989 and 1999, from 65 000 to 190 000 b/d. Gas output also rose, although not so spectacularly, from 38.3 to 51.9 bcm over the same period. This was enough to turn Uzbekistan from a net importer to a net exporter of hydrocarbons. It is currently exporting a modest 6 bcm/y of gas to its neighbours-Kazakhstan, Kyrgyzstan, Russia and Tajikistan—and approximately 1 mt/y (20 000 b/d) of refined oil products. However, by the late 1990s the production increases had stalled and international companies were walking away. In 1998 both Enron and Unocal pulled out of the country. One major reason was severe currency restrictions. The government currently appears to realize that it lacks the resources to effect a major further increase itself, with the state energy company, Uzbekneftegas, anticipating only that output in 2010 will reach 240 000 b/d. With some 70 per cent of the country's production coming from just one field (Kokdumalak in the Bukharo-Khivi region) the Uzbek authorities are naturally looking for a much more wide-ranging exploration programme as part of their revamped approach to foreign investment in oil and gas. In particular, they are looking to develop prospects on the Ustyurt plateau and in the Aral Sea region.

The Russian Caspian

The Russian Caspian essentially consists of four regions—the onshore republics of Kalmykia, Dagestan and Chechnya and the offshore regions of the north-east Caspian Sea. The US Energy Information Administration (EIA) estimates

²² From an Uzbek government document presented to Financial Times Energy, July 2000.

Russia's Caspian reserves at some 2.7 bbl.²³ This appears to be based on Sovietera data. Over the next year or two more reliable information, particularly concerning the region's offshore potential, should become known as results from Lukoil's drilling at the Severny prospect are made public—and come under further scrutiny. There are proven gas reserves in the region but their volume is disputed. The EIA cites no figure for these in its latest Caspian assessment.²⁴

Actual production is minimal. Oil production totalled a mere 11 000 b/d in 1999, down from 144 000 b/d in 1990. Similarly, gas output fell to just 0.8 bcm in 1999, from 6.1 bcm in 1990. Russia is pursuing an essentially nationalist approach to oil and gas development in both onshore and offshore areas along its Caspian coastline before starting to plan the development of offshore resources. In essence, Russian companies will develop those areas that Moscow considers to be the Russian sector, although there may be a role for Western firms in this development as Russian companies which have bid for offshore work have acknowledged that lack of capital makes it sensible for them to secure foreign participation. How large a stake might then be made available to foreign companies remains to be seen. General Russian policies that will also affect Caspian development include access to export pipelines—a critical issue for foreign investors in the Russian energy sector. Other key issues (affecting all of Russia, not just its Caspian regions) include clarification of the legal framework governing foreign companies' operations in Russia, with particular reference to the implementation and regulation of production-sharing agreements.

In December 1997 Lukoil won a tender for Russian companies to exploit part of the Caspian Sea shelf. However, it may not have the cash to carry out full oilfield development, particularly if it has indeed made a major discovery at Severny. This may be why three of Russia's energy giants, Lukoil, Gazprom and Yukos, announced on 25 May 2000 that they were joining up to form the Caspian Oil Company to prospect for oil in what they termed a 13 000 km² area of Russian Caspian waters.²⁵ In March 2000, Lukoil announced that it had struck oil in its Severny/Khvalynsky field in the northern Caspian.²⁶ Its first well, it said, had pointed to the presence of at least 300 million tonnes (2.2 bbl) of reserves, a size which, even if this referred to reserves in place, would still make it a major discovery. However, the Lukoil announcement was followed by reports that it might in fact have found more gas than oil, and by June the company was saying only that the first well's results had 'suggested the presence of commercial hydrocarbon reserves' without attaching specific figures. At the same time, Lukoil was reported to have started drilling a second well, usually a minimum requirement to determine even the approximate size of a field's proven reserves.²⁷ Similarly, initial suggestions that Lukoil was

²³ US Energy Information Administration, 'Caspian Sea region tables and maps', June 2000, URL http://www.eia.doe.gov/emeu/cabs/caspgrph.html>.

²⁴ US Energy Information Administration (note 23).

²⁵ East European Energy Report, issue 105 (June 2000).

²⁶ East European Energy Report (note 25).

²⁷ East European Energy Report (note 25).

looking to produce the first oil from the field by 2004 and that it hoped to produce as much as 300 000 b/d by 2008 currently look decidedly premature.

There has been some foreign company involvement in Russian Caspian energy development but it appears to be mainly confined to service companies. In 1996 JKX was negotiating a joint venture to develop the InchkeMore field off the coast of Dagestan in partnership with two of Russia's oil majors, Lukoil and Rosneft, and with the local Dagneft.

Iran

In August 2000, following a study based on seismic analysis rather than actual drilling, Iran announced that it believed it possessed up to 3 bbl of recoverable reserves in the Caspian²⁸—a useful figure, if marginal by comparison with the country's 90 bbl of proven reserves in and around the Persian Gulf. The deputy head of the National Iranian Oil Company (NIOC), Mehdi Mir-Moezzi, said on 21 August 2000 that 'preliminary seismic studies show that we have 10 bbl of in-place crude in our 20 per cent of the Caspian Sea, of which 2.5 to 3 bbl are recoverable'. The preliminary studies to which he referred were the outcome of a two-year study by the Royal Dutch/Shell group and Lasmo under a 1998 agreement which grants the companies exclusive rights to four development blocks should oil be discovered. The NIOC also announced that estimated recovery costs would be around \$5–7 per barrel, which lies within the industry's normal range, and that it was discussing plans for a tender covering construction of a semi-submersible rig for Caspian activity.²⁹

The NIOC official's comments should perhaps be viewed in the light of the Caspian Sea dispute. His mention of 'our 20 per cent of the Caspian Sea' raises questions concerning the precise locations of the hydrocarbon indications reported in the seismic survey. Iran's neighbours have not agreed that it should have a 20 per cent share of the sea; and, while Iran might expect to secure some 15–16 per cent of the sea on the basis of boundary lines agreed according to the principle of equidistance, if a straight line from its most northerly coastal points on the eastern and western coasts of the Caspian were to form the basis of a settlement—as appeared to be the case in the Soviet era—Iran would only control some 12 per cent of Caspian waters. A key question is whether Shell and Lasmo confined their operations to areas of the sea where Iran's exploration rights would not be likely to be challenged under any partition agreement.

Immediately before the signing of the 1998 agreement, the Foreign Ministry of Azerbaijan formally protested to the British and Dutch governments that the agreement with Shell and Lasmo affected a part of what it termed the Azerbaijani sector of the sea.³⁰ The Caspian finds will provide some additional impetus for Iran's drive to secure foreign investment for upstream oil and gas

²⁸ East European Energy Report, issue 108 (Sep. 2000).

²⁹ East European Energy Report (note 28).

³⁰ Radio Free Europe/Radio Liberty, Iran Report, vol. 2, no. 5 (1 Feb. 1999).

development, but the core of Iranian activities will continue to be its fields further south, in and around the Persian Gulf.

II. Caspian pipelines: the carriage of Caspian oil and gas to market

The 1990s were filled with speculation as to how Caspian oil and gas could be carried to hard-currency markets. The first decade of the 21st century should see real progress in that regard, although it will probably be slower than the Caspian producer governments would like.

Oil pipelines

There are at present three significant oil export pipelines in operation with a combined capacity of well under half-a-million barrels of oil a day. These will be dwarfed with completion in the summer of 2001 of the CPC's 560 000-b/d line from the giant Tengiz oilfield in Kazakhstan to Novorossiysk.

The three existing lines are:

1. *Atyrau–Samara*. This is a 280 000-b/d capacity Soviet-era line which runs from the Kazakh terminal at Atyrau to the Russian Urals refinery at Samara and then connects with Russia's main East–West Druzhba system.

2. *Baku–Novorossiysk*. This Soviet-era line runs from the oil terminals outside the port of Baku to Novorossiysk through southern Russia. It has a nominal capacity of 180 000 b/d, but Western oil men in Baku consider that the Russian section, part of which was re-routed in 1999–2000 to avoid Chechnya, still limits throughput from Azerbaijan to approximately 50 000 b/d.

3. *Baku–Supsa*. This line, opened in late 1998 with first deliveries in March 1999, runs from Baku to the Georgian Black Sea port of Supsa. It currently has a capacity of 115 000 b/d but work has begun on doubling capacity to 230 000 b/d.

These are not the only ways by which Caspian oil reaches international markets. There is considerable export by rail (some reports estimate it as high as 240 000 b/d), with deliveries sometimes as far afield as China and Finland, and barges use the Volga–Don canal system to carry Caspian, and especially Kazakh, oil to international markets. A 'swaps' system with Iran is also operational, although at a much lower level than might have been expected: oil from Kazakhstan, Turkmenistan and Azerbaijan goes by tanker or barge to Iran's Caspian ports, while Iran makes available an equivalent volume (or value) of oil in the Gulf.

Apart from the CPC's Tengiz–Novorossiysk line, two other essentially new projects are already physically under way which will add to capacity. These are:

5. *Neka–Tehran*. This line involves the construction of a new pipeline within Iran from the Caspian port of Neka to a refinery just outside Tehran which will enable swaps traffic to increase to 390 000 b/d.

6. *Dyubendi–Batumi*. This line runs from the Azerbaijani oil terminal at Dyubendi to the Georgian port of Batumi and should have an initial capacity of 70 000 b/d, perhaps rising later to 140 000 b/d. It is being developed by Chevron to handle Kazakh crude from the Tengiz field which will first be shipped across the Caspian from the Kazakh port of Aktau. In due course it will probably handle output from Texaco's North Buzachi field.

However, all this capacity barely exceeds 1.2 mb/d, and as such major fields as Tengiz, Karachaganak and the ACG complex approach full production—let alone Kashagan and some 100 smaller fields which would be capable of exporting—significant increases in pipeline capacity will be required. There are two main prospects in this regard, and two other serious contenders.

The two advanced proposals, both aimed at carrying Caspian crude to European and Mediterranean markets, are:

1. *Expansion of the CPC line*. This would take the Tengiz–Novorossiysk line up to a capacity of 1.3 mb/d.

2. *Baku–Ceyhan*. This would be a brand-new 1.0 mb/d-capacity line from Baku to the Turkish Mediterranean port of Ceyhan. The AIOC, which is developing the ACG complex, is obliged under its 1994 contract to help the Azerbaijani authorities choose a route for what is officially termed the MEP and which is intended to carry ACG crude to market. This is the route preferred by the Azerbaijani Government (and by the US and Turkish governments) for the MEP and the AIOC member companies are trying to develop a viable Baku–Ceyhan project, but they have not yet secured full financing.

The two serious contenders are:

1. *Kazakhstan–Turkmenistan–Iran (KTI)*. This would run along the eastern coast of the Caspian and link the oilfields of north-western Kazakhstan with the oil markets on northern Iran, via the western region (and oilfields) of Turk-menistan. Its rationale would be to take advantage of the opportunities offered by Iranian swaps to limit actual construction costs and provide a system for, in effect, increasing Caspian/Iranian exports to Asia–Pacific markets.

2. *Expansion of Baku–Supsa*. This would increase capacity to at least 500 000 b/d. It is under consideration as a possible route for Azerbaijan's main export pipeline. A new or substantially enlarged Baku–Supsa line could be either an alternative to the Baku–Ceyhan line or the first stage of a system that would eventually end at Ceyhan.

Various other oil pipeline proposals, although they may have been discussed at various times at quite senior levels, remain ideas that are not likely to lead to serious project work for many years, if at all. These proposals include:



Figure 3.1. Caspian oil and gas pipelines, existing, under construction and proposed

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Notes:

1. The Baku-Novorossiysk oil pipeline, operational.

2. The Baku-Supsa 'early oil' pipeline, operational since early 1999.

3. The Baku–Ceyhan oil pipeline project designated MEP route in a series of agreements signed in Istanbul in November 1999 by Azerbaijan, Georgia, Turkey and the USA.

4. The Baku–Tabriz oil pipeline project, possible Azerbaijani oil export option, studied by Total.

5. Atyrau-Novorossiysk (the CPC project) oil pipeline, scheduled to be operational in 2001.

6. Atyrau-Samara, the Druzhba system oil pipeline (operational).

7. Tengiz–China oil line project, under study and not likely to be operational for several years.

8. The Turkmenistan–Pakistan–Central Asian oil pipeline, with possible tie-in from Kazakh fields; unlikely in the near future.

9. Tengiz/Uzen-Kharg. Preliminary oil pipeline proposal by Total.

10. The Trans-Caspian (Tengiz–Uzen–Aktau–Baku) oil pipeline project. It would be a de facto extension of Azerbaijan's MEP.

11. The Trans-Caspian Gas Pipeline (TCGP) project.

12. The Blue Stream gas pipeline from Russia to Turkey, scheduled to be operational in 2001.

13. The Neka–Tehran oil pipeline project which could constitute major element in the 'swaps'/pipeline export system from the Caspian to the Persian Gulf.

14. The Korpedze-Kurt-Kui (KKK) gas pipeline, operational since 1997.

15. The Tabriz-Erzurum gas pipeline, scheduled to be operational in 2001.

1. *Baku–Novorossiysk*. This is officially the third of the three alternative routes for Azerbaijan's planned MEP (the others being Baku–Ceyhan and Baku–Supsa). At various times the Russian authorities have proposed a full upgrade of this line to perhaps a capacity of 1.0 b/d, which would in effect require construction of an entirely new line.

2. *Kazakhstan–China*. The governments of Kazakhstan and China signed a memorandum of understanding in 1997 which provided for the rapid start of work on such a project, but it was only in late 2000 that the Chinese committed themselves even to a feasibility study. This line may eventually be built, but not for some time.³¹

3. *The Central Asian Oil Pipeline* (CAOP), also known as a trans-Afghan line. Detailed studies on the construction of such a line, with a capacity of up to 1.0 mb/d, were carried out by Unocal in 1996–97. The project makes good sense in terms of delivery to a port in Pakistan, but the political situation in Afghanistan makes it unlikely that it will in fact be built.

What has changed during the first years of post-Soviet enthusiasm for Caspian projects is that various ambitious schemes are now being seen in a much colder and more sceptical light than heretofore. Thus Unocal has itself

³¹ China appears to have twice committed itself to carrying out a feasibility study. In 1997, a study was included in the memorandum of understanding agreed with the China National Oil Company for oilfield development, although the following year one Western oil man, just back from Kazakhstan, told the author that what China considered to be a feasibility study would in Western terms be considered no more than a preliminary pre-feasibility study. In late 2000, after a period of considerable Kazakh concern at developments concerning China's proposed energy projects in Kazakhstan, a Chinese delegation was reported to have agreed to carry out what would presumably be a proper feasibility study.

abandoned its plans for gas and oil pipelines from Turkmenistan to Pakistan via Afghanistan, even though its former junior partner, the Saudi Delta Oil company, is still seeking to pursue the project with some UN backing. Prospects for oil or gas lines to China—an oil line from western Kazakhstan, and a gas line from Turkmenistan via Kazakhstan—are similarly still a long way off.

As of early 2001, the following specific proposals, or general approaches, for resolving the Caspian export conundrum continue to merit serious attention: (*a*) the *CPC oil pipeline from Tengiz to Novorossiysk*; and (*b*) the westward line, the *MEP from Azerbaijan to either Ceyhan or Supsa*. It is also worth keeping an eye on the planned gas connection to Turkey from Azerbaijan, since the two countries agreed in March 2001 that this would follow the same route through the Caucasus as the Baku–Ceyhan oil pipeline.

This list is not intended to exclude other major potential developments, notably the construction of a trans-Caspian oil pipeline or developments outside the immediate region, such as a line from Burgas in Bulgaria to the northern Greek port of Alexandroupolis, or a connector from Odessa in Ukraine to the Druzhba oil pipeline system in Poland. At this stage, however, they remain ideas for the future and their implementation will largely depend on how the current dilemma of securing Kazakh and Azerbaijani oil exports to the outside world is realized.

The status of the CPC

The CPC is the project that ought to have been built in the mid-1990s—it was first proposed in 1992³²—but is clearly a case of better late than never. After years of waiting, the project for a 1580-km pipeline between Kazakhstan's giant oilfield at Tengiz and a new terminal to be built near Novorossiysk is now being implemented.³³ Pipelaying was completed in late 2000 and oil was scheduled to arrive in Novorossiysk in July 2001 for loading onto tankers. The project essentially involves laying 745 km of new pipeline between Novorossiysk and the Russian city of Komsomol'skaya; inspecting, renovating and upgrading to Western standards some 800 km of pipeline laid in the last years of the Soviet Union between Komsomol'skaya and Tengiz; a new crossing of the Volga; and a new offshore terminal near Novorossiysk.

The pipeline will have a first-phase capacity of 28.5 mt/y (567 000 b/d) but further expansion is taken for granted, with three subsequent phases due to raise capacity to 67 mt/y (1.35 mb/d). However, the speed of further expansion remains unclear. Prolonged wrangling between the consortium's partners in the run-up to their key agreement of 25 November 1998 led to a cap of \$2236 million being placed on first-phase spending. This limited the finance available to build in expansion options from the start, and at the time appeared to indicate that the CPC's partners might even be contemplating abandoning

³² Roberts, J., *Caspian Pipelines* (Royal Institute of International Affairs: London, 1996).

³³ 'Three steps forward, two steps back', Middle East Energy Report, issue 39 (30 Apr. 1999).

plans for the second, third and fourth phases. As of 2001 the CPC is still talking about eventual capacity of 67 mt/y but has produced no timetable for this.

The issue is particularly important for Kazakhstan, which anticipates using some 21 mt/y of initial first-phase (28.5 mt/y) capacity, and would have been expected to secure some 50 mt/y of the eventual 67 mt/y capacity. However, Kazakhstan received good news in October 2000 when a \$900 million contract was signed under which CCC–Saipem, a Greek–Palestinian and French joint venture, is to build a 635-km connecting pipeline to link the giant gas/ condensate field of Karachaganak to the CPC line. A spokesman for the Karachaganak Petroleum Operating (KPO) group (a joint venture including Agip, British Gas, Texaco and Lukoil) said that this will enable the KPO group to increase output of condensate from 4 mt/y (80 000 b/d) in 2000 to 11 mt/y (220 000 b/d) by 2003.³⁴ The principal companies involved in the project are Fluor Daniel, the overall supervisor; a Franco-Russian joint venture, Starstroi, which groups France's Bouygues and Spie-Capag and the local Kubanneftegastroi and Stavropoltruboprovodstroi; and two pipe suppliers, Chicago Bridge and Iron and the local Volzhskiy Pipe Works.

One important issue is whether the line's main advantage may now have been lost. CPC agreements provide for a fixed tariff of \$25 per tonne (\$3.425 per barrel) for oil shipped through the line, with roughly 40 per cent of all income, once the line's construction costs have been met, distributed as dividends, 30 per cent going to the governments of Russia and Kazakhstan as transit fees and only 20 per cent being set aside for operating costs. In other words, it is viewed by the governments not simply as a mechanism for ensuring export earnings by carrying oil to hard-cash markets but as a revenue mechanism in its own right. Throughput costs for Kazakh oil from Tengiz including the \$25 tariff are estimated at \$30 per tonne, while oil from Kumkol would have to pay approximately \$38 per tonne. Moreover, the costs for delivery from Novorossiysk have to be added to these figures.

What the CPC project does prove at long last is that a large-scale pipeline transiting Russia, while primarily serving non-Russian Caspian producers, is feasible—even if such projects appear unusually prone to delays. However, the CPC is now being built in a competitive environment, so its owners are less able to count on artificially high transit fees, and this may affect post-first phase expansion. In particular, the CPC will have to compete with what is now becoming a proven oil export corridor—the Baku–Supsa line from the Caspian to the Black Sea. And, with oil already flowing into Georgia along that line, an even more ambitious alternative presents itself—Baku–Ceyhan.

Baku–Ceyhan

As of early 2001, most AIOC member companies, together with the governments of Azerbaijan, Georgia and Turkey, the three countries through which the line would pass, have agreed to pursue the option of developing a Baku–

³⁴ 'Karachaganak pipeline contract signed', East European Energy Report, issue 109 (Oct. 2000).

Ceyhan line with a capacity of approximately 50 mt/y.³⁵ At the time of writing, in March 2001, a preliminary \$20 million engineering study commissioned by the Baku–Ceyhan sponsors' group and begun in December 2000 was half-way through its work. The key issue was whether the group would then commission a \$120 million detailed engineering study for the route. A decision on the detailed study was due in the summer of 2001 and, if approved, would almost certainly lead almost seamlessly into actual construction. A series of major bilateral and multilateral agreements necessary for the line's construction and operation have been signed, notably the three host-nation agreements. The gov-ernmental commitment to pursue the project was epitomized by Azerbaijan's willingness to forgo transit revenues in order to ensure Georgia's agreement to a tariff structure based on no more than \$2.58 per barrel. (Azerbaijan, of course, stands to secure its return from the project through the sale of its own oil, whereas for Georgia, which is expected to be more of a recipient than a supplier of crude oil from the pipeline, transit income is vital.)

Nonetheless, the Baku–Ceyhan pipeline remains the most complex of all the prospective pipeline projects in the region to evaluate. The proposal is straightforward-construction of a line of between 1800 and 2000 km (depending on the precise route chosen) to link the Azerbaijani terminal of Sangachali, just south of Baku, with the Turkish Mediterranean port of Ceyhan. The advantages of such a line are considerable. It would serve exporters not only in Azerbaijan but also in Kazakhstan-indeed, the current proposals are predicated on a substantial input of Kazakh oil.³⁶ It obviates the need for oil tankers to pass through the delicate ecosystem of the Turkish Straits (the Bosporus, the Sea of Marmara and the Dardanelles) for at least Azerbaijani, if not for Russian, crude oil exports. Cevhan is a deep-water port that can service 300 000-tonne supertankers, whereas the Bosporus is limited to tankers of around 100 000-150 000 tonnes. In addition, navigation of supertankers in the Aegean Sea involves considerable environmental hazards.³⁷ Ceyhan itself is located on as isolated a stretch of Mediterranean coast as can be found anywhere in modern Europe, thus minimizing the environmental impact. Politically, the line has very strong backing indeed, not least from the Turkish and US governments.

³⁵ For a full analysis of the finely poised question whether BP and its co-sponsors would indeed move on to actual construction of the Baku–Ceyhan line and on its interrelationship with the gas pipeline between Azerbaijan and Turkey, see Roberts, J., *Energy Economist*, issue 233 (Mar. 2001) and *East European Energy Report*, issue 114 (Feb. 2001). These articles were written a few weeks before the 12 Mar. 2001 agreement on Azerbaijani gas sales to Turkey and accompanying governmental comments that for almost 1000 km, from the Baku area to near the eastern Turkish city of Erzurum, the Baku– Ceyhan oil pipeline and the line to carry Azerbaijani gas to Turkey would follow the same route.

 36 The exact capacity of the line and the respective volumes of Azeri and Kazakh crude remain undecided. A capacity of 1.0 mb/d (50 mt/y) is the figure most often cited, but Turkey was initially contemplating a 900 000 b/d (45 mt/y)-capacity line, while corporate studies have been carried out for a range of volumes. At least 400 000 b/d would probably come from Azerbaijan and Kazakhstan, and perhaps as much as 50 000–100 000 b/d could also be expected from Turkmenistan so long as its dispute with Azerbaijan over the development of fields in the central–south Caspian is laid to rest. Whether Azerbaijan or Kazakhstan would be expected to fill the rest of the line's capacity remains in doubt.

³⁷ See also section IV below.

Proponents of the Baku–Ceyhan scheme have to yet to answer a set of related questions: (*a*) who will finance the considerable costs of the line; (*b*) when such finance will be forthcoming; (*c*) who will supply the oil volumes required to justify its construction; and (*d*) when that oil will be available. While there are no clear answers to these questions, there are some key pointers.

The pipeline's most ardent proponents, the governments of Turkey and the USA, both hope to see the pipeline built and operational by October 2004. In September 2000 most of the AIOC's member companies duly came together to set up a sponsors group to develop the Baku–Ceyhan line, thus ensuring that finance would be made available for the detailed engineering study on which, corporate sources said, work was due to begin before the end of 2000. The study was expected to be ready by mid-2001 and, participants in the project say, this timetable will allow the sponsors group to judge whether it can begin raising capital for the project.³⁸ However, it appeared clear to some senior officials in AIOC member companies that actual construction work on the project, even assuming that all goes well and that finance can be secured in the first half of 2001, would not start until well into 2002 at the earliest, making it highly unlikely that the October 2004 target date would be met.

There are major issues to be faced in terms of availability of oil to fill the pipeline. Its capacity would be 1 mb/d. Azerbaijan is slated to provide some 400 000–500 000 b/d, but the line would only come into operation once Azerbaijan was already exporting some 250 000–300 000 b/d by other routes (at least 200 000 b/d via Supsa and a further 50 000–100 000 b/d via Novorossiysk). In addition, Iran is likely to import some Azerbaijani output in the form of product from the Baku refinery and may import some by barge to its Caspian ports. Baku–Ceyhan can thus only come into its own once Azerbaijan's output reaches approximately 750 000–800 000 b/d—a volume not likely to be reached until around 2008–2010. Already it has become clear that the AIOC is postponing a major expansion of output capacity at its ACG concession until the prospects for the Baku–Ceyhan route (or some other MEP) become clearer.

Then there is the question whether the Baku–Ceyhan route should be considered as a means of providing an integrated solution to the question of oil exports from all, or most, of the Caspian region. Turkish proposals for the Baku–Ceyhan line initially focused on the provision of facilities to transport some 25 mt/y from Azerbaijan and a further 20 mt/y from Kazakhstan. The assumption is now that if the line is to be of 50 mt/y, Kazakhstan will have to provide half the input.

Kazakhstan's leaders regularly show interest in exporting their country's oil through the Baku–Ceyhan line but they have not yet proved willing to commit specific volumes of oil to it, and such a commitment is crucial to the project's viability. In November 1999, after signing a framework agreement on the Baku–Ceyhan line during the Summit Meeting of the Organization for Security and Co-operation in Europe (OSCE) in Istanbul, President Nazarbayev said that

³⁸ Author's notes, Sep. 2000.

Kazakhstan was in no position to promise the volumes of oil the pipeline's backers require. He also declared: 'The Baku–Ceyhan pipeline cannot take place without oil from Kazakhstan'.³⁹

When US Ambassador-at-Large Stephen Sestanovich, Special Adviser to the Secretary of State, visited the Caspian region in December 2000 this was widely seen as a US attempt to secure a firm throughput commitment from Kazakhstan, but it appears to be reluctant to make such a commitment, at least at present. Visiting Baku after bad weather thwarted a planned meeting with President Nazarbayev, Sestanovich was reported to have expressed approval for what was termed the Kazakhstani Government's stated interest in exporting oil via Baku–Ceyhan and he suggested that the line might then be renamed the Aktau–Baku–Ceyhan line in honour of this proposed trans-Caspian element.⁴⁰ However, interest is not the same thing as commitment. A joint press release issued in Almaty merely referred to Kazakh backing for increased tankerage of Kazakh oil from Aktau to Baku.

In a way, Kazakhstan's real response was made in a different fashion. While Sestanovich was speaking in Baku, the Kazakh Foreign Ministry was issuing an announcement that it was holding talks with prominent international oil companies on quite another oil export pipeline project—the proposed KTI line.⁴¹

On the commercial side, the issues are enormous. The AIOC has estimated that transport costs for crude oil shipment to Supsa are likely to be about half of those required for shipment via Ceyhan. Transport represents a major element in overall Caspian production and delivery costs, while pipelines also provide an opportunity for countries to secure transit royalties. The AIOC estimates that its oil costs about \$5 per barrel to produce, with transport costs of \$2-4 per barrel (to Supsa) taking the total to \$7–9 per barrel. According to various sources, in March 1999 Tengizchevroil was paying \$30 per tonne (\$4.1 per barrel) to transport oil from Aktau in Kazakhstan to Batumi in Georgia, via tanker to Dyubendi in Azerbaijan, pipeline to the Azerbaijan-Georgian railhead, and then rail to Batumi.⁴² In 1998 Tengizchevroil exported 1.8 million tonnes by this route, with expectations of similar amounts for 1999. Previous indications were that in 1997–98 it was costing Chevron as much as \$56 a tonne (\$7.67 a barrel) to get its oil from Tengiz to Batumi. For its part, Georgia hopes to gain \$6 million per year from the dispatch through the Baku–Supsa line of some 100 000 b/d and 'up to US\$365 million a year, though probably not before 2005' if a full-scale Baku–Supsa line is chosen as the MEP. Similarly, for a Baku–Ceyhan line, it was reported that 'Ankara could raise tariffs to industry levels, earning as much as \$357 million a year'.43

³⁹ 'Kazakh stand over Azeri oil pipeline project', *Business Digest*, 24 Nov. 1999.

⁴⁰ Turan (Baku), 6 Dec. 2000.

⁴¹ Reuters (Astana), 'Kazakhs in talks to develop oil pipeline to Iran', 6 Dec. 2001.

⁴² See, e.g., Caspian Times News Archive, 'Tengizchevroil halts cross Caspian crude shipments', 19 Feb. 1999, URL http://www.caspiantimes.com/html/states/azerbaijan/admin/azeriF.shtml. This cites a cost for transport across Azerbaijan and Georgia of \$4.30 a barrel, equivalent to \$31.39 a tonne of crude.

⁴³ Recknagel, C., '1998 in review: slump in prices could delay Caspian oil boom', Radio Free Europe/ Radio Liberty, Prague, 17 Dec. 1998.

Until 1996 it was commonly anticipated that construction of a Baku–Ceyhan line would cost approximately \$2.5 billion. In 1998 the US company Amoco, one of the partners in the AIOC, commissioned a feasibility study from Fluor Daniel. This estimated the cost at \$3.2 billion for a line capable of carrying 50 mt/y (1.0 b/d). By late 1998, the AIOC was asserting that the cost could be as much as \$3.7 billion, compared to \$1.8 billion for a similarly sized Supsa line and \$2.5 billion for an MEP from Baku to Novorossiysk. Contemporary Turkish estimates that a line would cost approximately \$2.2 billion were attributed by the AIOC to key differences concerning technical specifications, the route the line would take between Georgia and Ceyhan, and allowance for contingencies.⁴⁴

As soon as there is a formal announcement that the line will definitely be built—in other words, that there is cash available to build it—then the Baku– Ceyhan route will become vulnerable to alternative proposals. In particular, Russia could suddenly decide that it will become a much better partner in terms of providing facilities for Caspian exports via Russian pipelines. An announcement by Moscow that it was prepared to transport an additional 15–20 mt/y of Kazakh crude via the Druzhba system would go far to pre-empt any Kazakh commitment of oil volumes to the Baku–Ceyhan project, since new connections to Druzhba would be both cheaper and quicker to build than Baku–Ceyhan. Similarly, construction of a prospective pipeline to Iran would be a much easier, and shorter, alternative to Aktau–Baku–Ceyhan.

It is the prospect of effective alternatives that haunts the Baku–Ceyhan project. It needs firm commitments of Kazakh throughput if it is to be viable. The Government of Kazakhstan, meanwhile, seems determined to view the Baku–Ceyhan route as just one alternative among many; but the Baku–Ceyhan route is not simply an alternative project—it is unique in that it is the only major pipeline scheme with a real prospect of commercial support that would enable Caspian producers to pipe their oil to market along a purely commercial system that bypassed both Iran and Russia.

It is not that pipelines through Iran or Russia do not inherently make sense in fact they make excellent sense and should be exploited—but a key element in ensuring that they are operated on an essentially commercial basis and are not subjected to political pressures from the Iranian or Russian governments is the competition posed daily by a significant alternative. In practice this means a route to the West, through the South Caucasus or, in other words, Azerbaijan's proposed MEP. The Baku–Ceyhan route is the logical first choice—but only if Kazakhstan makes a firm and formal commitment of oil to the project. Similarly, the timing of such a project will be determined by the timing of such a commitment. If no commitments prove forthcoming from Kazakhstan in 2002, the prospects are that the member companies in the Baku–Ceyhan sponsors' group will cast their eyes increasingly on a cheaper, if less perfect, alternative—Baku–Supsa.

⁴⁴ 'Azerbaijan "faces loss" if Turkey pipeline is chosen', *Financial Times*, 24 Nov. 1998.

Baku–Supsa

In October 1995 Supsa was chosen, along with Novorossiysk, as one of the twin outlets for 'early oil' produced by the AIOC. Ironically, at the time, because of Georgia's doubtful political stability, it was regarded as the weaker candidate and was only added in because of political pressure from the Turkish and US governments. Now Novorossiysk is, in practice if not in theory, out of the running as a Black Sea candidate for an MEP terminal.

Supsa presents a strong case since a line can be constructed either by building a completely new line or by expanding the early oil pipeline completed in early 1999 and, in effect, gradually transforming it into a de facto MEP. The history of the Baku–Supsa route to date provides some indication that the latter course remains quite likely. In 1995, the Baku–Supsa early oil line was to have been a medium-cost project estimated at \$236 million essentially based on linking disparate stretches of existing pipeline and having a capacity of 100 000 b/d. By 1996, with a realization that considerable stretches of new line would be required, orders were placed for extra pumping stations to take capacity up to at least 200 000 b/d, with costs put at \$315 million. In 1998, with the discovery that virtually no existing pipe could really be integrated into the system, anticipated costs escalated to \$590 million, but it also seemed clear that the capacity of what would be in effect a brand-new line for 90 per cent of its length could easily reach 300 000 b/d, even though the highest level the AIOC publicly envisaged was 230 000 b/d. Indeed, in 2000, with the line constantly working at or close to its initial 115 000 b/d capacity, work began to secure at least a doubling of capacity to 230 000 b/d.

As of early 2001, the question naturally emerges whether the existing pipeline will simply end up as one pipe of an eventual twin-pipe system. Since the AIOC and its Georgian affiliate, the Georgian Pipeline Company, already possess rights of way all the way from Sangachali to Supsa, construction of an MEP along this route would offer no real challenge, whether financial or political, that has not already been met in developing the original early oil line. Moreover, since it is in effect the AIOC itself that is developing the existing Baku–Supsa line and operating the new Supsa terminal, it would expect to have similar responsibility for, and control over, an MEP on the Baku–Supsa route.

Baku–Supsa vs Baku–Ceyhan

In 1997 two of the AIOC's most senior officials, Terry Adams (then president) and Greg Rich (then president of the pipeline group), declared, according to a rapporteur: 'International politics will influence the final choice of a main export pipeline. To the extent that political considerations contradict commercial considerations, a question arises as to who should pay the shortfall for a "sub-optimal solution".⁴⁵

⁴⁵ Adams, T., 'Great power politics and the Azerbaijan oil pipeline: an update', Address to the Washington Institute for Near East Affairs, Washington, DC, 19 Feb. 1997.

At that time the issue of whether Azerbaijan's MEP should terminate at Supsa or Ceyhan was finely poised. In 1998 it appeared to this author that the oil companies clearly preferred the Supsa option but that the US and Turkish governments wanted Ceyhan. Thus in November 1998 Adams' successor as AIOC President, John Leggate, commented on Baku–Ceyhan: 'We understand the importance of this route. Nevertheless, not a single company supporting it has suggested it would participate in financing the project'.⁴⁶ He was speaking, of course, at a time when oil prices were falling and the AIOC was slowing down its development programme. It now seems likely that the ACG complex will not be producing at its intended Phase One level of 400 000 b/d until 2004 at the earliest. The question is whether the existing early oil systems—as developed, modified or expanded between 1996 and 2004—will be able to handle this level. It looks as if they might so long as there is some real improvement of the Baku–Novorossiysk line to add to Baku–Supsa's increased capacity.

The weakness of the Baku–Ceyhan route is that it seems that it cannot be developed in phases—at least, this does not appear to make sense if the line is built directly between Baku and Ceyhan, with a crossing into Turkey from central–south Georgia. One possibility does still exist for a phased development—the construction of an initial line to Supsa, primarily to serve the AIOC, and an onward extension to Ceyhan as and when the next round of Azerbaijan joint ventures starts to yield results, or when output from the Kashagan field is such that the Kazakh authorities, and especially the companies actually developing Kashagan, feel capable of making a realistic throughput commitment to a Ceyhan line.

The Baku–Supsa route is not an ideal solution in the way, perhaps, that the Baku–Ceyhan route is, but it has one advantage: it would be a much easier project to implement in an era of low or volatile oil prices, since a 50 mt/y line to Supsa would probably cost approximately \$1.6 billion as against perhaps double that amount for a line to Ceyhan. In addition, a two-step solution provides an opportunity to test the demand for oil traffic through the Bosporus, since rising oil demand within the Black Sea region itself may well diminish some of Turkey's worst fears. Moreover, the fact that oil development in both Azerbaijan and Kazakhstan is running somewhat slower than expected at the very least delays the need for a full-scale system to Ceyhan, with all the costs implied.

As of early 2001, it looks very much as if the oil companies have swung behind the US and Turkish governments and are serious in their attempts to probe and if possible prove the practicality of the Baku–Ceyhan line. However, senior officials in at least some of the AIOC member companies still hold to the Baku–Supsa route as a fallback position, to be brought into play should Baku– Ceyhan fail to materialize.

⁴⁶ International Herald Tribune, 30 Nov. 1998, quoted in Radio Free Europe/Radio Liberty, *RFE/RL* Caucasus Report, 1 Dec. 1998.

Baku–Novorossiysk

The oil companies in the AIOC have officially three routes under serious consideration. The third is the Baku–Novorossiysk line.

This is a route fraught with difficulties. It entails a transit of the troubled Russian republic of Dagestan, although since Russia completed its 'Grozny Bypass' project in April 2000 it no longer runs through the war-torn territory of Chechnya. During the past five years the Baku–Novorossiysk line has been repeatedly subjected to interruptions, either as a result of physical warfare in Chechnya or because of tariff disputes.

Although it has been operational in its present form for five years, the actual capacity of the Baku–Novorossiysk line remains unknown. The original Soviet design specification, when the line carried oil to Baku for refining rather than from Baku for exporting, was 9 mt/y (180 000 b/d) for the section between Baku and Grozny and 15 mt/y (300 000 b/d) for the section between Grozny and Tikhoretsk in southern Russia, where it joins a much larger oil export system. The AIOC upgraded the section of the line from Baku to the Russian border to at least 100 000 b/d capacity but generally limited actual throughput to no more than 50 000 b/d because it was uncertain whether Russia's Transneft had carried out sufficient repairs to the line within Russia to ensure that it could carry more than this.⁴⁷ In practice most of the oil shipped north by this route is supplied by SOCAR, which has a 1996 contract calling for, at present, some 2.3 mt/y (46 000 b/d) to be shipped through the line. SOCAR's inability or reluctance to ship oil north prompted a fierce set of exchanges in mid-2000, with Russia demanding that SOCAR pay some \$29 million in penalties.

Although Transneft has put forward the concept of using the Baku– Novorossiysk route as an MEP, the cost is estimated at anything up to \$2 billion for a route that would be longer than the Baku–Supsa line but would still only carry Caspian oil to a Black Sea terminal and not to a deep-water port such as Ceyhan. In addition, because it transited Russia (and bearing in mind the problems and delays encountered by the CPC in developing its pipeline across Russia), it is highly unlikely that the international oil companies would secure the same degree of control over the line as they have managed to secure in both Azerbaijan and Georgia for the Baku–Supsa early oil line.

Iranian swaps and proposals for a Kazakhstan–Turkmenistan–Iran oil pipeline

Iran is now making a major effort to become a transit route for Caspian oil exports. A realistic programme of limited pipeline construction and an imaginative use of swap arrangements should eventually ensure a steady flow of oil from Kazakhstan and Turkmenistan, and perhaps from Azerbaijan as well. However, the scale of such flows remains uncertain. At the same time, Kazakh

⁴⁷ In Dec. 1999, when a landslide damaged the Baku–Supsa line, the AIOC was reported to have pumped some 75 000 b/d along the Novorossiysk line for a 2-week period, but this was when the Chechen section of the line was out of action and when rail transport was being used to bypass the breakaway republic. *Platt's Commodity News*, 3 Dec. 1999.

stan is now seriously looking at the prospects for constructing an oil pipeline to link Kazakhstan, Turkmenistan and Iran.

Several factors appear to favour the eventual development of a coherent system of oil swaps and pipeline deliveries that would ensure a substantial flow of Caspian oil (or Iranian oil swapped for Caspian oil) into Asian markets. First, the government of President Mohammad Khatami in Iran is lobbying hard for a large-scale swap system that would eventually take Kazakh and Turkmen crude to the Gulf by means of at least one reversed pipeline across Iran. Second, Iran is actually building a new line which would be a major element of any hybrid scheme to transport Caspian exports to the south on a large scale. Third, in December 2000 the Kazakh Foreign Ministry announced that it had held talks with three leading international oil companies during which it had asked them to conduct a feasibility study for the KTI oil pipeline project.⁴⁸ Fourth, China may become a more important player than expected if plans for major Caspian exports to Iran, or via Iran to Asian markets, gather speed.

The structure currently envisaged by the Iranian Ministry of Oil and Gas is based on an initial period of swaps, with Kazakh and Turkmen oil imports serving Tehran and other north Iranian cities. Despite low oil prices, Iran demonstrated its commitment to such a programme in January 1999 with the award of a \$350 million contract to an Iranian company, Mapna, to build a new 325-km oil pipeline from the Caspian port of Neka to the refinery serving Tehran. However, financial problems delayed the start of actual construction work until October 2000. There seems to have been an assumption when the project was originally tendered that foreign investment funds would be available. Iran's apparent reliance on external funding for such a basic project indicated that in 1999 it could not afford to finance such a scheme out of its own resources, in contrast to the situation in 1995–97 when it paid for the \$200 million gas line from Korpedze in Turkmenistan to Kurt-Kui in Iran (the KKK line) without recourse to foreign funding.

Under the Iranian proposals crude oil from Iran's Caspian neighbours would be tankered across the Caspian to Neka, piped to Tehran, and then used either in Tehran or in one of Iran's other three central or northern refineries, at Isfahan, Arak and Tabriz. Iran would pay for the oil in kind, handing over its own crude at Gulf terminals, notably Kharg Island, for export on behalf of the Caspian suppliers. Iran envisages this as the first stage of a programme which would then be expanded by means of a second, 350 000 b/d-capacity line from the Caspian to Tehran, although perhaps starting from another Caspian port such as Bandar Anzali.

Although the Iranians themselves generally accept that there is a limit of approximately 700 000 b/d on the capacity of northern Iran to absorb Caspian supplies, some Iranian officials have talked of as much as 810 000 b/d being brought to northern Iran for local use by means of coastal pipelines to the Tehran area. This figure appears to be a reflection of the potential capacity of

⁴⁸ Reuters (Astana), 'Kazakhs in talks to develop oil pipeline to Iran', 6 Dec. 2001.

the Neka–Tehran line now under construction, the proposed new line from the Caspian to the capital, and an existing line from Neka to Tehran, which has a nominal capacity of approximately 100 000 b/d but is apparently limited to 40 000 b/d along some stretches.

Looking beyond this, Iran has pondered the option of a direct oil pipeline connection with Kazakhstan and Turkmenistan, with direct transport of this oil to the Gulf being effected by reversing one of the two pipelines currently used to carry Caspian crude inland (and uphill) from the Gulf to Tehran, one of which passes through Arak and the other through Isfahan. Were both the Gulf–Tehran pipelines to be reversed (an idea mulled over by some Western analysts, but unlikely to find favour with Tehran because it might change Iranians' perceptions of their country's energy security), the Iranians estimate that their country could serve as the end-user for up to 810 000 b/d of Caspian crude and as a direct transit system for a further 810 000 b/d.⁴⁹

The step-by-step nature of this project is one of its greatest assets. Because it can be developed in phases, it limits initial costs while also enabling those costs to be recovered quickly. However, it should be noted that previous swap arrangements with Kazakhstan have promised much more than they have actually delivered, partly because the Iranians themselves appeared to have doubts about one agreement they signed and partly because of quality problems concerning the input of Kazakh crude into Iranian refineries.

The Neka–Tehran pipeline should also serve some Azerbaijani exports, but while Azerbaijan does already export some oil to Iran (mainly in the form of refined product) the opening of the Baku–Supsa line in 1999 means that its pressures are not quite so great. France's Total has occasionally proposed a pipeline to carry Azerbaijani crude direct to the Tabriz refinery, while in the summer of 2000 Iran also proposed development of a direct oil pipeline from Azerbaijan to Iran.

As long as the Iranians and their suppliers are able to implement this step-bystep approach smoothly, there is a very real prospect of the eventual development of a full-scale oil pipeline system extending from the Kazakhstan oilfields of the north-western Caspian to the Gulf.

The Kazakhstan-China oil pipeline

In 1997 the China National Petroleum Corporation (CNPC) signed an agreement with Kazakhstan which committed it to various projects including an oil pipeline eastwards from the Uzen oilfield on the Caspian to China. This was an initiative which owed much to China's own need for external oil supplies and, in effect, constituted a reserve addition scheme by the CNPC. It may also have reflected a growing worry in Beijing concerning the prospects for development of the Tarim Basin in Xinjiang. In these circumstances the scheme must be

⁴⁹ The Iranian swap option was presented in some detail by the Deputy Minister for Oil and Gas, Ali Majedi, at the Adam Smith Institute's Pipeline Conference in Vienna in Mar. 2000. Similar presentations have been made at subsequent international conferences, most notably by senior Iranian officials attending the World Economic Forum's Eurasia Economic Summit meeting in Almaty in Apr. 2000.

taken very seriously indeed. Actual construction is not likely to start for several years, and by that time it is possible that an alternative system for delivering Kazakh crude oil to Chinese markets may be operational.

The confirmed discovery of large volumes of oil at Kashagan in 2000 naturally prompted some changes in Chinese and Kazakh thinking concerning this project, but these were relatively straightforward and do not as yet appear to have had a significant impact on the way in which officials of the two countries and their respective state oil concerns view the projected pipeline. Originally it was to have started at Atyrau. It would then pass through Kenkiyak and Kumkol to reach the Karakoin station of the existing Omsk–Chardzhou pipeline. From there it would run north of Lake Balkhash to cross the border between Kazakhstan and China near the town of Druzhba. Since the discoveries at Kashagan, it appears that the Kazakhs, at least, view the proposed line as an export system for oil from their giant offshore field, and there is no real reason for the Chinese to differ from this point of view.

The total length of the pipeline in Kazakhstan would be 2600–2900 km, depending on the final route chosen downstream of Karakoin. In 1998 two alternatives were under discussion—construction of a new line on the most direct alignment from Karakoin to Druzhba, and reversal of the 427 km-long Atasu–Karakoin section of the existing Omsk–Chardzhou pipeline, with new line construction in this area starting at Atasu.

Nominal capacity appears to have been set at 20 mt/y, the throughput guaranteed by the CNPC. This was mentioned in the original 1997 discussions, in further talks in 1998 and again in a Kazakh statement in October 2000. In conducting its promised feasibility study, the CNPC will find itself confronting some very complex questions that throw doubt on the project—at least as long as it remains focused on construction of such a limited-capacity line.

There are four interrelated issues which will determine the viability of the project: (a) the length of the line in practice—in other words, taking into account its extension into China itself; (b) the volume of throughput required to make a success of the line throughout its length (if normal commercial considerations predominate); (c) the volumes of oil available in Kazakhstan to fill the line; and (d) the question whether the Chinese Government and the CNPC will take a strictly (or at least predominantly) commercial approach to their evaluation of the project.

A 20 mt/y-line appears to be far too small to be economic. Commercial economic considerations would be expected to require the construction of a line with considerably greater capacity, probably of 45–50 mt/y. This is largely because the length of the line on which the two countries are negotiating in fact only represents about half of the system that would actually have to be built, since China's requirement is for oil to serve its industrial areas possibly as far away as its main oil markets on or near its eastern and southern coasts.

It should be noted, however, that there are potential non-commercial reasons why both countries may be prepared to pursue the project with this capacity even if they are not necessarily assured of a commercial rate of return. Energy

security is a potentially important consideration for both that could prompt them to require less than full commercial viability. The Kazakh authorities are particularly keen on the project because it includes the construction of an internal West–East oil pipeline link which would bring oil from Kazakhstan's westerly Caspian or near-Caspian fields to the industrial east. This would enable the country to reduce its dependence on energy imported from or via Russia. Germany's ILF Consulting Engineers, together with KazNipiNeft, in 1995 carried out a feasibility study for a domestic pipeline from Atyrau via Kenkiyak to Karakoin, with ILF coming to the conclusion that it made best sense if it was part of a larger pipeline system connecting to China.

For its part, the Chinese Government may be prepared to adopt a less than fully commercial approach to the project because it has the potential to yield a sustained supply of crude oil which does not have to transit any third country. Even so, the question how much oil Kazakhstan will be able to supply to fill the line remains crucial.

Whether the projected Kazakhstan–China oil pipeline is implemented will depend, *inter alia*, on whether the next few years witness a further acceleration of the commercialization of CNPC thinking, or whether Chinese Government concerns about energy security in an era when it is a net oil importer continue to dominate its strategic thinking. Security concerns on the part of producers and the need for high-quality oil could provide an opportunity for Russian and/or Caspian exports, since oil from the Middle East, the most obvious alternative, tends to be heavier and more sour than Caspian oil. The absence of intervening transit states and the promise of finance from a credible, creditworthy partner, the CNPC, should aid the project.

If commercial thinking predominates in an atmosphere in which there is still concern about energy security, the CNPC might start considering the development of export systems via Iran. If pure commercial thinking does triumph, one element worth bearing in mind is that CNPC officials in 1998 expressed their willingness to cooperate with Turkmenistan on an oil line down the Caspian coast to Iran. On the one hand, this could provide an opening for Turkmenistan to pursue possible oil sales eastwards along the proposed Kazakhstan–China oil pipeline. On the other hand, the development of a coastal line constitutes, in effect, full or partial construction of the KTI line that was discussed by the Kazakh Government and leading Western oil companies in December 2000. If such a line were built soon, and if the Iranian swap option worked smoothly, Kazakh oil would reach Far Eastern markets, including China, by a much cheaper route than the proposed Kazakhstan–China pipeline.

Once again, the fate of one proposed pipeline project remains intimately bound up with the fate of another.

Gas pipelines

The question how best to secure gas exports from the Caspian region to the outside world depends on the interplay between a number of complex factors concerning the start, middle and end of the energy chain.

The factors are the following. From a supply perspective, there is the willingness of Turkmenistan, the country with the greatest reserve potential, to create a satisfactory business environment that would encourage major gas projects rather than discourage investors. From a transit perspective, there are the willingness of Russia's Gazprom and its Itera associate to use its existing network to facilitate gas exports at commercial rates, and the ability of Turkmenistan to cooperate with its neighbours, notably Azerbaijan and Iran, in developing transit routes. Finally, from a demand perspective, there are the short- to medium-term requirements of Turkey and the long-term demands of the global gas market.

Existing gas pipelines

At present, the following gas pipelines are in existence.

1. *The Gazprom system*. This is the Soviet-era main gas line system which connects Turkmenistan, Uzbekistan and Kazakhstan with Russia, and, beyond Russia, with an array of markets from the new states of the Caucasus to Ukraine, Central Europe and beyond.

2. *The trans-Balkan line*. This connects the old Soviet system with Turkey via Romania and Bulgaria and is the main route for current Turkish imports of Russian gas. A major expansion of this line, initially intended to increase capacity from 6 bcm/y to 10 bcm/y, was completed in the final months of 2000, with officials from GazExport, a Gazprom subsidiary, saying in late 2000 that as of early January 2001 the line's capacity would 14 bcm/y.⁵⁰

3. *Korpedze–Kurt-Kui*. The 200-km KKK line was built by Iran in 1997 to link the Turkmen gas fields around Korpedze, on the eastern shore of the Caspian, with the Iranian gas distribution system at Kurt-Kui. Its capacity is approximately 10–12 bcm/y but deliveries to date have not exceeded 3 bcm/y.

4. *Tabriz–Erzurum*. This is a new line intended to carry Iranian gas to Turkey from the north-eastern Iranian city of Tabriz to the eastern Turkish city of Erzurum. The 272-km Iranian section has been completed and the line is due to enter service in July 2001 with completion of the 302-km Turkish section. Connections from Erzurum onwards are under construction.

Under construction are the following:

1. *Blue Stream*. This line, from Izobil'noye in southern Russia to Ankara via a sub-sea pipeline across the Black Sea from Dzhubga to Samsun, is progressing so well that Russian Prime Minister Mikhail Kasyanov declared in October 2000 that first deliveries of gas through the line could take place as early as the

⁵⁰ 'Turkey set for massive rise in gas imports', East European Energy Report, issue 110 (Nov. 2000).

autumn of 2001.⁵¹ Blue Stream is the most important of the current gas line projects. The first phase, currently under way, requires laying an 8 bcm/y-capacity pipe at depths of up to 2150 m for approximately 384 km across the Black Sea. A second line will then be laid along a roughly parallel course. A third line has occasionally been discussed. The sub-sea section of the line is costed at approximately \$1.7 billion, with financing coming, *inter alia*, from Italy's SACE and a variety of other export credit agencies.

2. *Erzurum to Ankara and Konya*. Turkish companies are currently building a set of lines which will connect the eastern city of Erzurum with both Ankara and Konya in south-central Turkey. This system was originally intended to bring Iranian gas to central, southern and western Turkey but, with active plans for an line to bring Azerbaijani gas to Turkey, Turkish officials during most of 2000 envisaged using it primarily for the transport of gas from Azerbaijan.

Under consideration are:

1. *Baku–Erzurum*. BP has begun engineering studies for a system that would use existing gas lines in Azerbaijan and eastern Georgia, together with some new construction in Georgia and Turkey, to carry Azerbaijani gas to Turkey by early 2003, or even late 2002. This is an ambitious target, but the project is being pursued very seriously indeed.

2. *The Trans-Caspian Gas Pipeline* (TCG1). This is intended to carry some 16 bcm/y of Turkmen gas to Turkey and a further 14 bcm/y through Turkey to markets in Southern and Central Europe, and would involve a sub-sea crossing of the Caspian and transit across Azerbaijan and Georgia to Erzurum in eastern Turkey. It was under very active consideration for much of 1998 and 1999, but in 2000 one of its principal backers signalled its inability to pursue the project in the face of the somewhat erratic attitudes towards major project development of Turkmenistan's President Niyazov. The project is not dead but is most certainly dormant.

3. *The trans-Iranian gas pipeline*. Proposals for a major gas line to carry Turkmen gas to Turkey and Europe via Iran were under active consideration in the early 1990s and, indeed, President Niyazov somewhat prematurely held a ceremony in 1994 which supposedly marked the start of construction of the line. In fact, nothing has yet been built unless the KKK line is considered part of a larger line (which it could well become in the future). At present, both Shell and Total are considering the possibility of such a line. However, for Shell, which is perhaps the better placed of the two because it also has an agreement covering gas field development within Turkmenistan, it is just one option of three, the others being the TCGP (in which it is now the sole active partner) and improved connections via Russia and the Gazprom network.

4. *The trans-Afghan gas pipeline*. The development of a gas export system to serve not only Turkmenistan but Uzbekistan and Kazakhstan as well, and with its core section running from Chardzhou in Turkmenistan to Pakistan's Sui gas

⁵¹ 'Turkey set for massive rise in gas imports' (note 50).

fields, was pursued with vigour by Unocal in the mid-1990s, but in 1997, acknowledging the problems of building such a line in the face of continued turmoil in Afghanistan and against the wishes of the US Government, Unocal pulled out. Its junior partner of that era, the Saudi-backed Delta Oil group, remains committed to the project, while the UN also sees such a line as one of the few prospects for weaning Afghanistan's economy off its dependence on drug exports.

5. *A gas line to China and Japan*. Although Mitsubishi and subsequently the US company Exxon have for some years been considering a gas line from Turkmenistan across Kazakhstan and China to the Yellow Sea, this is not likely to be realized until about the year 2010. The project was first broached by Mitsubishi in talks with the CNPC and the Kazakh and Turkmen authorities in the early 1990s. This led to a protocol between China and Turkmenistan stating their intention to build a 6000-km pipeline to the eastern coast of China, with onward facilities to take gas to Japan. In 1995 Exxon, which is developing fields in Xinjiang in western China, joined forces with Mitsubishi to begin a feasibility study. One key question that will have to be addressed is the cost of either constructing a liquefaction plant on the Chinese coast—Lianyungang is mentioned as a site—and acquiring a tanker fleet to ferry the gas as liquefied natural gas (LNG) to Japan, or constructing a further 900-km undersea link. Overall project costs are currently put at approximately \$12 billion.

In terms of customer requirements in the Caspian gas context, the role of Turkey is crucial, simply because it is the nearest major market in need of gas and, for geopolitical considerations, is particularly well disposed to purchasing its gas from the Caspian states. Turkey's demand for natural gas is increasing rapidly. It stood at just 2.9 bcm/y in 1989 but had risen to 12.0 bcm/y in 1999. The Turkish Government and Botas, the state pipeline company, have produced estimates that demand could reach 27 bcm in 2010 and 50 bcm in 2015.

As for the Far East, the Chinese market alone is expected to double or even triple between 1995 (when it was 16.7 bcm/y) and 2010. Although Asia continues to consume large volumes of fuel oil (currently comprising 24 per cent of total oil demand), this will decline with continued conversion to natural gas. The share of fuel oil in total demand is projected to drop to 18 per cent by 2010. The World Bank has estimated that gas from Central Asia could be piped the 6000 km to China at a cost of some \$106 per thousand cubic metres, as long as volumes of approximately 27–28 bcm/y are envisaged. This would compete with domestic coal prices of \$120 per thousand cubic metres of gas equivalent. For Japan, however, the cost would be considerably higher in view of the need to transport Central Asian gas across the Yellow Sea as LNG or under it by pipe.

The International Energy Agency (IEA) argued in 1998 that Japan's interest in Central Asian gas supplied via China 'is probably more an expression of long-term thinking about security of supply rather than a declaration of intent to support such a project in the near future'.⁵² It added that importing Russian gas via a regional centre such as Irkutsk was probably a more economic long-term option.

III. The Caspian Sea legal regime

As of early 2001, it looks very much as if all five Caspian littoral states are beginning to move steadily in the direction of a solution to the vexed question of the status of the Caspian. The issue is often presented as a need to agree on whether the Caspian is a sea—which can therefore be partitioned—or a lake, which should be shared by the littoral states. In fact, the question whether it is a sea or a lake has relatively little bearing on the underlying questions whether or not the Caspian's hydrocarbon resources are to be partitioned up between the five littoral countries and, if so, how that division should be effected.⁵³ All five countries now openly favour partition of at least the sub-sea resources—in other words, its known or presumed oil and gas reserves—but substantial disagreement remains on how to put that division into effect. There also appears to be general agreement that some kind of common regime needs to be established for the sea itself to protect fisheries (notably the caviar-bearing sturgeon) and to ensure a reversal of severe environmental degradation.⁵⁴

Azerbaijan and Kazakhstan, spurred on by the prospect of discoveries of hydrocarbons close to their coastlines (or in what they term their national sectors), have long favoured the principle of partition. Turkmenistan, which had hitherto favoured common development of resources in most of the sea (all the countries have acted as if they own at least a 12-mile coastal zone), in 1997 began considering the prospect of partition. Russia, buoyed by the discovery of oil at the Severny field off the Dagestan coast, has likewise moved away from a concept of common development to one of outright division, as has Iran. But the five states are not necessarily in agreement with each other on how any partition should be effected.

Russia has made two key proposals in this regard. On the one hand, it has pushed for a division of sub-sea resources rather than of the sea itself; on the other, it has argued for this partition to be effected on the basis of what it terms a 'modified median line'. In doing so, Russia has dropped its 1997 proposal for national sectors extending out as far as 45 miles into the Caspian, with all resources lying beyond such a line to be developed on behalf of all five states, in favour of the extension of national sectors that would together cover the whole of the sea. (Although the absence of a general agreement on the partition

⁵² International Energy Agency, 'Caspian oil and gas: the supply potential of Central Asia and TransCaucasia', Paris, May 1998.

⁵³ At its simplest, the argument is that, since the Caspian has no outlet to the rest of the world's seas, it is technically a lake, albeit one of enormous size. If it is a lake, the question then arises whether it can be partitioned. This is not common practice, but it has occurred in the Great Lakes of both North America and Central Africa.

⁵⁴ On the fisheries and environmental aspects, see chapter 4 in this volume.

of the Caspian's sub-sea resources makes it incorrect to talk about individual national sectors of the sea, such language is common in all five littoral states.)⁵⁵

The modified median line controversy

The first proposal has secured widespread backing in the region because it makes practical sense—there really is a need to develop a common regime for handling actual maritime issues of the Caspian Sea—but the second is more controversial. The use of a median line—a line running at an equal distance from the acknowledged coastal baselines of the states in question—is increasingly becoming the most common way of settling maritime boundary disputes. By a modified median line, Russia is saying that it favours the principle of equidistance in principle but that in practice, where a field has already been developed by a country or where a field found by one country spills over the median line and into waters which might be held to belong to another state, the line should be modified to keep the field intact.

Kazakhstan and Russia both appear prepared to determine their maritime, or rather sub-sea, boundaries on this basis, and in January 2001 President Aliyev of Azerbaijan similarly endorsed the proposal.⁵⁶ Turkmenistan has not yet signalled a formal response to Russian initiatives aimed at securing a general Caspian agreement on the basis of modified median lines, while Iranian statements on the Caspian run directly counter to this idea.

Turkmenistan's position is relatively straightforward: before it commits itself to any general settlement it wants to know just where the dividing line will be between its own waters-or, rather, the sub-sea reserves under those watersand those of Azerbaijan. In this context the problem is that Azerbaijan's historical legacy as the centre for the old Soviet oil industry in the Caspian led to oil exploration and attempts by the Government of Azerbaijan to get concessions in waters lying beyond any likely median line. One such field, called Serdar by Turkmenistan and Kyapaz by Azerbaijan, is disputed by the two countries. Turkmenistan also disputes Azerbaijan's right to include all or part of the Azerbaijani field (and sometimes the Chirag field as well) in its major 1994 agreement with the AIOC for development of the unitized ACG complex. In January 2000 SOCAR reported that Turkmenistan had warned the AIOC that it had no legal right to develop the Azerbaijani and Chirag fields.⁵⁷ Despite a major three-year effort by the US Government to get Azerbaijan and Turkmenistan to resolve their boundary issue (and ensure the smooth development of the TCGP project), the two countries are still at odds over this issue.

⁵⁵ It would, of course, still be incorrect to talk of national sectors of the Caspian Sea if any actual partition agreement were in strict fact to relate solely to the seabed and to whatever lies underneath the seabed. However, to take such a line might be deemed too pedantic.

⁵⁶ ITAR-TASS, 9 Jan. 2001, in 'Russia, Azerbaijan issue statement on need for consensus on carving up Caspian', Foreign Broadcast Information Service, *Daily Report–Central Eurasia* (FBIS-SOV), FBIS-SOV-2001-0109, 9 Jan. 2001.

⁵⁷ 'Regional pipelines: TCP talks enter crucial phase', *Middle East Energy Report*, issue 57 (2 Feb. 2000).

Iran changes tack

Iran has on the one hand changed its policy dramatically while on the other hand it is holding out for a settlement that would require substantial modification to likely median lines.

Iran was the last supporter of the concept of joint development along condominium lines of the bulk of the Caspian's offshore hydrocarbon resources. It then moved towards a position that favoured the equal division of the Caspian's sub-sea resources, with each state securing exactly 20 per cent of the seabed. However, in March 2000 Deputy Foreign Minister Morteza Sarmadi declared that Iran would back any partition to which the other four states might agree as long as Iran secured a 20 per cent stake at the southern end of the sea. His comments came just four days after Kazakh Foreign Minister Yerlan Idrisov said in Astana that five-party talks on the Caspian had not yielded 'much of a breakthrough' and that Iran had not responded to Kazakh questions concerning Iran's views on how an equal 20 per cent division might be effected.⁵⁸

While Sarmadi's comments opened up the possibility of a general agreement on how to approach the Caspian Sea question, they continued to muddy the waters concerning the specific bilateral boundary agreements that are necessary to put a five-party accord into effect. The reason is that on normal median line principles Iran can expect to secure no more than 15–16 per cent of the sea. This is more than the 12 per cent of the sea which lies south of a straight line drawn between its two most northerly positions on the Caspian's east and west coasts, Astara and Gasankoff, but is still far short of 20 per cent. The logical assumption is that Iran is simply pressing a maximal demand and that it will settle for less. However, simply by presenting a claim for 20 per cent, Iran is ensuring that negotiations with both Azerbaijan and Turkmenistan for bilateral sub-sea boundary lines are likely to prove extremely tense, since any expansion of de facto Iranian waters would be at their expense. As noted above, Azerbaijan and Turkmenistan are already in dispute over where their common boundary might run.

The same seems to be true of Kazakhstan and Russia. When Russia's Special Envoy for Caspian Sea Affairs, Deputy Foreign Minister Viktor Kalyuzhny, visited Baku in July 2000, he was reported as saying that Kazakhstan and Russia were disputing the ownership of four fields. In further talks in Baku in January 2001 the heads of state of both Russia and Azerbaijan sought to stress the prospects for resolution of this dispute, notably by saying that they endorsed a call by Turkmenistan's President Niyazov for a summit meeting to be held in late February or in March 2001 to resolve the issue of the Caspian's status.⁵⁹ The presidential talks in Baku also signalled a further change in Russia's position. In July Kalyuzhny had proposed to Natiq Aliyev, President of SOCAR, that the Caspian littoral states should jointly develop oil and gas deposits whose ownership was disputed. Turan, the Azerbaijani news agency, reported that he

⁵⁸ 'Tehran changes tack on the Caspian', Middle East Energy Report, issue 60 (13 Mar. 2000).

⁵⁹ 'Russia, Azerbaijan issue statement on need for consensus on carving up Caspian' (note 56).

specifically mentioned the Kyapaz/Serdar field. Azerbaijan rejected this proposal.

The joint statement signed on 9 January 2001 by Russian President Vladimir Putin and President Aliyev of Azerbaijan recorded agreement on the principle of the modified median line, with the waters of the Caspian remaining available for common use. However, the statement then said that each littoral state would have exclusive rights to the mineral resources in its sector of the sea. This phrasing was taken as meaning that Russia had abandoned its July 2000 approach.⁶⁰

IV. The Turkish Straits issue

One common problem confronting any oil pipeline terminating on the Black Sea coast is the onward transmission of oil. The Turkish Straits are narrow, the Bosporus having four major bends in just 30 km and being just 700 metres wide at the Kandili narrows. In addition the Straits are crowded with thousands of small boats crossing between the European and Asian shores each day. As well as being a thoroughfare for traffic heading into or out of the Black Sea, they are thus also a hive of shore-to-shore activity. The Straits are capacity-constrained, although just what the technical upper limits on safe transit of oil tankers might be remains a matter of dispute. Two factors need to be considered: (*a*) the size of vessels using the Straits; and (*b*) their handling.

Most tanker traffic through the Straits has in recent years consisted of fairly small (by global standards) vessels of between 5000 and 10 000 tonnes. The Straits could handle vessels of up to 100 000 tonnes, or indeed up to 150 000 tonnes as long as they do not draw more than 18 metres of water. Travelling individually through the most problematic section of the Straits—the Bosporus—Turkish pilots allow 2 hours and 40 minutes for a large tanker (any vessel of 10 000 tonnes or more) to travel from the Black Sea to the Sea of Marmara or vice versa. If a strict convoy system were operated, with perhaps a 15- or 20-minute interval between tankers, throughput would no doubt be vastly increased, but it would add to Turkey's very real fears of another incident like the collision between a freighter and an oil tanker which killed 29 seamen in 1994. The danger of a fire in the confined waters of the Bosporus and of it spreading to the Old City of Istanbul or to the historic wooden mansions along the shore remains very real to most citizens of Istanbul.

In addition, the 1936 Convention Regarding the Regime of the Straits (the Montreux Convention) specifies that passage through the Straits shall be without taxes or charges and 'without formalities', which means that any measures to regulate traffic which the Turkish authorities might seek to introduce can be challenged. A traffic-calming scheme introduced by Turkey in 1994 seems to have worked, in that ships passing the Straits obey it, but a

⁶⁰ 'Putin, Aliyev narrow differences on Caspian division', *Eurasianet Turkmenistan Daily Digest*, 10 Jan. 2001, URL http://www.eurasianet.org/resource/turkmenistan/hypermail/news/0008.html>.

strong legal challenge can be made if Turkey seeks to restrict passage on safety grounds. Thus the handling of vessels using the Straits requires consensus.

After contracting hugely after the breakup of the Soviet Union, traffic through the Straits is now increasing again. The IEA has noted that it was 60 mt/y in the late 1980s and early 1990s, but had slipped to 37.5 mt/y in 1991/92.⁶¹ The latter figure is still commonly cited by Turkish officials as their baseline for Bosporus transit oil traffic although, as the IEA further noted, in 1995 such traffic through the Turkish Straits had recovered to between 60 and 70 mt/y.

The IEA/Energy Charter team estimate the maximum capacity of the Turkish Straits at 75–90 mt/y. This figure is probably too low: the introduction of a convoy system and the replacement of small tankers with medium-sized vessels of up to 100 000 b/d could increase capacity somewhat. However, the underlying point is sound: the Turkish Straits cannot be expected to cope with the kind of volumes that will probably require passage out of the Black Sea by 2010 or indeed, if the IEA's capacity estimates are correct, in 2005. Moreover, while large tankers are more efficient, they also bring with them much greater consequences should something go wrong.

In 2010 oil flows from the new Caspian states and Russia are expected to reach between 140 and 195 mt/y. The recent Kashagan discovery makes the larger estimate probable, and this in turn implies an increase in Caspian inflows of approximately 135 mt/y over Soviet peak levels and of 157.5 mt/y over the post-Soviet levels commonly used by Turkey as its baseline for Bosporus traffic.

Such figures are, of course, the prime justification for the proposed Baku– Ceyhan pipeline or for any of the other 'Bosporus bypass' schemes. Apart from the Baku–Ceyhan line, however, these projects all have one significant weakness: they are posited on the piping of oil to one shore of the Black Sea and its carriage by tanker across the Black Sea before the oil is once again pumped onshore and carried by pipe to its next destination. This flaw affects such proposals as the proposed line from Burgos in Bulgaria to Alexandroupolis in northern Greece; the proposals for lines through the Balkans to Vlorë in Albania or Trieste in Italy; and purely internal Turkish lines such as a planned bypass across Thrace from Kiyikoy to Ibrikbana.

All these projects either have serious backers or have been seriously studied at one time or another. They are made viable because of the Turkish Straits problem, but were that to disappear, or to be seen to be about to disappear, with the start of work on a Baku–Ceyhan line, the *raison d'être* for these Bosporus bypasses would disappear. At the same time, if the Baku–Ceyhan line were to secure financing and be given a definite green light, then the prospects that Turkey would adopt a reasonably flexible attitude to the issue of oil traffic through the Turkish Straits in the interim would be vastly improved.

⁶¹ International Energy Agency and the International Energy Charter Secretariat, 'Black Sea oil and gas', Paris, 2000.