

## **Oil /Gas Development in Russia, Kazakhstan and Azerbaijan and the Impacts on the International Market<sup>1</sup>**

**Ken Koyama, PhD  
General Manager  
Energy Strategy Department  
Institute of Energy Economics, Japan**

### **Chapter 1 Russian Oil/Gas Development and Future Prospects**

#### **(1) Oil development: current situation and outlook**

Russia's crude oil production, the world's largest at 11.42 million barrels/day (MMBD) as of 1987, kept steeply plunging after the Soviet Union fell apart, hitting a low of 6.04 MMBD in 1996 (Fig. 1)<sup>2</sup>. The massive production fall resulted from a combination of various factors. These include shrinking investments and material/equipment supplies to the oil sector, both attributable to social/economic turmoil and stagnation during the post-Soviet days, and markedly deteriorating productivity that stemmed from problematic oilfield management.

However, the Russian crude oil production bottomed out in 1996 and entered into a period of strong recovery. Particularly since 2000 when a visible upturn was made, Russia produced 6.50 MMBD in 2000, 7.02 MMBD in 2001 and 7.66 MMBD in 2002, thus recording a considerable output increase of 1.50 MMBD (up 24%) in the three years after 1999. The underlying upward production trend still continues and production in February 2003 reached an estimated 8.04 MMBD.

The massive output rise is chiefly attributable to recovered or surging production in existing principal oil-producing areas, notably West Siberia<sup>3</sup>. Analyzing what contributed to the sharply rising production from the existing major oilfields, it was found that: (1) As a result of the crude oil price spike on the international market since 1999 and the weak Ruble stemming from the Russian financial crisis in 1998, the Russian oil firms' earnings (in Ruble term especially) improved remarkably, which enabled them to invest more in the domestic oil upstream sector; (2) Expanding introduction/application of advanced technologies under strategic alliance with Western oil

---

1 This paper is a report on studies commissioned to IEEJ by the Agency of Natural Resources and Energy, Ministry of Economy, Trade and Industry in FY 2002. With the permission of the Ministry, this paper has been made available to the general public. The author is grateful for the understanding and cooperation of those concerned in the Ministry.

<sup>2</sup> Russia's crude oil output quoted here is based on the IEA publications, including IEA, "Oil Market Report: Annual Statistical Supplement."

<sup>3</sup> For example, Eastern Bloc Energy states that 80% of Russia's total output increase in the period 1999~2001 came from greater production in West Siberia.

engineering service firms<sup>4</sup>, combined with raised technical/management efficiencies<sup>5</sup> by human-resource transfer/know-how from the majors oil companies, allowed Russia to gain additional reserves, production/development cost cuts and optimization of production projects. These all contributed to remarkably increasing investment efficiency and productivity in the oil sector. These two factors are counted as the principal causes of the production turnaround.

Backed by sharply rising output since 2000, Russia has fast regained its presence on the international oil market. At the beginning of 2002, Russia even outstripped the Saudi's briefly on a monthly output basis and thus temporarily resumed the throne of the world's largest oil producer. Therefore, future Russian crude oil production trends are a matter of great concern. Given the factors behind output increases to date, there is a strong likelihood that the Russians will be able to sustain their constantly growing oil production in the years to come.

Certainly undeniable is that the soaring crude oil price since 1999 has played a crucial role in helping Russian oil firms expand their investment and boost crude oil production. In this sense, if the current crude oil price decreases markedly, the high-price effect of spurring oil production could wane. Yet, given the downward production cost of Russian firms, which reflects recently expanding introduction/application of advanced technologies and increasing management efficiency, upstream investment by Russian firms will probably be kept at a constant level unless there should happen to be an extreme oil price slump. What is more, Russia is still extremely rich in hydrocarbon resource potential. And because not only the effect of advanced technology introduction is sustainable, but also Russia still has ample "room" for further expanding such technological application, greater production can be expected from new oilfield development aside from production maintained or increased in the existing producing areas<sup>6</sup>. Although production could slip to a milder tempo than the high-pitch rises over the past three years, Russian crude oil production is likely to keep growing constantly and reach about 10 MMB/D by 2010.

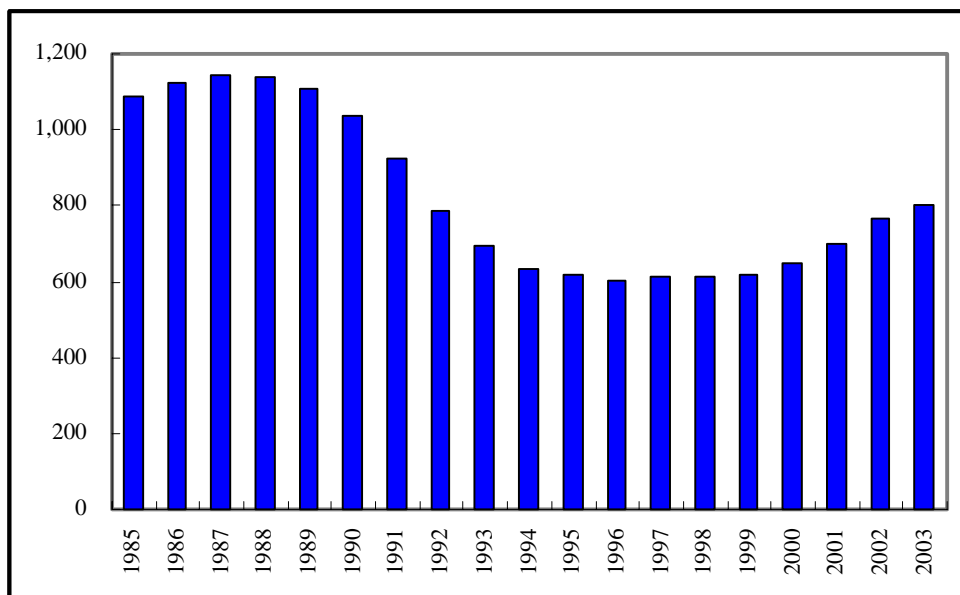
---

<sup>4</sup> Yukos, a representative Russian oil firm, concluded in 1998 a technical alliance with Schlumberger, an engineering service company. Sibneft, another oil firm, also executed a technical alliance with Schlumberger and Halliburton.

<sup>5</sup> For example, Yukos, among others, invited many ex-major employees and placed them in posts of responsibility.

<sup>6</sup> Paradoxically, falling crude oil prices, if continuing, should spur the Russian oil firms' needs for starting full-scale foreign capital introduction, which, if attained, could have a favorable effect on Russia's production increases in the long run.

**Fig. 1 Russian Crude Oil Production (Unit: 10,000 B/D)**



(Note) The figure for 2003 is estimated as of February 2003.

(Source) Prepared based on the IEA, "Oil Market Report Annual Statistical Supplement," among others.

**(2) Oil export pipeline projects**

Russia’s oil exports (particularly crude oil exports) have been steadily increasing along with the expansion of oil production. In 2002 crude oil exports reached some 3.75 MMBD (188 million tons), up 53% over 1995 records. Of these exports, 80% or some 3.10 MMBD was bound for Europe and the remainder for the CIS member countries. As a result of expanding exports, chiefly to Europe, plus the surging crude oil price, oil export revenues have swollen so much as holding a greater ever importance in the whole Russian economy<sup>7</sup>.

Currently Russians export their oil through the Druzhba pipeline and/or from nine export terminals, such as Novorossiysk and Odessa. The existing export infrastructure has a combined capacity of 4.00 MMBD or so, which is presently believed to be basically running at nearly full capacity<sup>8</sup>.

As discussed in the preceding section, if Russian oil production continues to expand, the capacity of the existing export infrastructure could pose a bottleneck. For this reason, Russia has presently several export-terminal/pipeline-construction projects under consideration. Among the

<sup>7</sup> Taking the trade statistics of 2001 as an example, oil (crude oil + petroleum products) exports earned \$34 billion, or 33% of Russia’s total export revenue of \$101.6 billion.

<sup>8</sup> With shipments from Primorsk Port (capacity: 240,000 B/D) via the Baltic Pipeline System (BPS) having started late 2001, the operation rate of Ventspils Terminal (Lithuania) is reportedly deteriorating.

projects, those targeting the European/American markets include (1) Baltic Pipeline System's capacity expansion (from 240,000 B/D to one million B/D) and (2) new construction of Murmansk Export Terminal (of over one million B/D) and related pipeline construction. Those aiming at the Asian market include (3) construction of a new China (Daqing)-bound pipeline (600,000 B/D) and (4) a new Pacific Coast (Nakhodka)-bound pipeline (one million B/D)(Fig.2)<sup>9</sup>. Given the importance of larger oil export revenues for Russians, either one of these projects will no doubt materialize in their effort to make Russia's growing production potential a reality. Aside from Europe-ward export routes, the conventional mainstream of Russia's infrastructure projects, new projects bound for Asia (or U.S.) are also under consideration right now. The main emphasis for shifting to the Asian and US markets are such factors as, the maturing European oil market, Russia's need to diversify oil export markets, the projected surges in the imports by Asia (and the U.S.), and the higher oil price in the Asian market versus the U.S./Europe<sup>10</sup>.

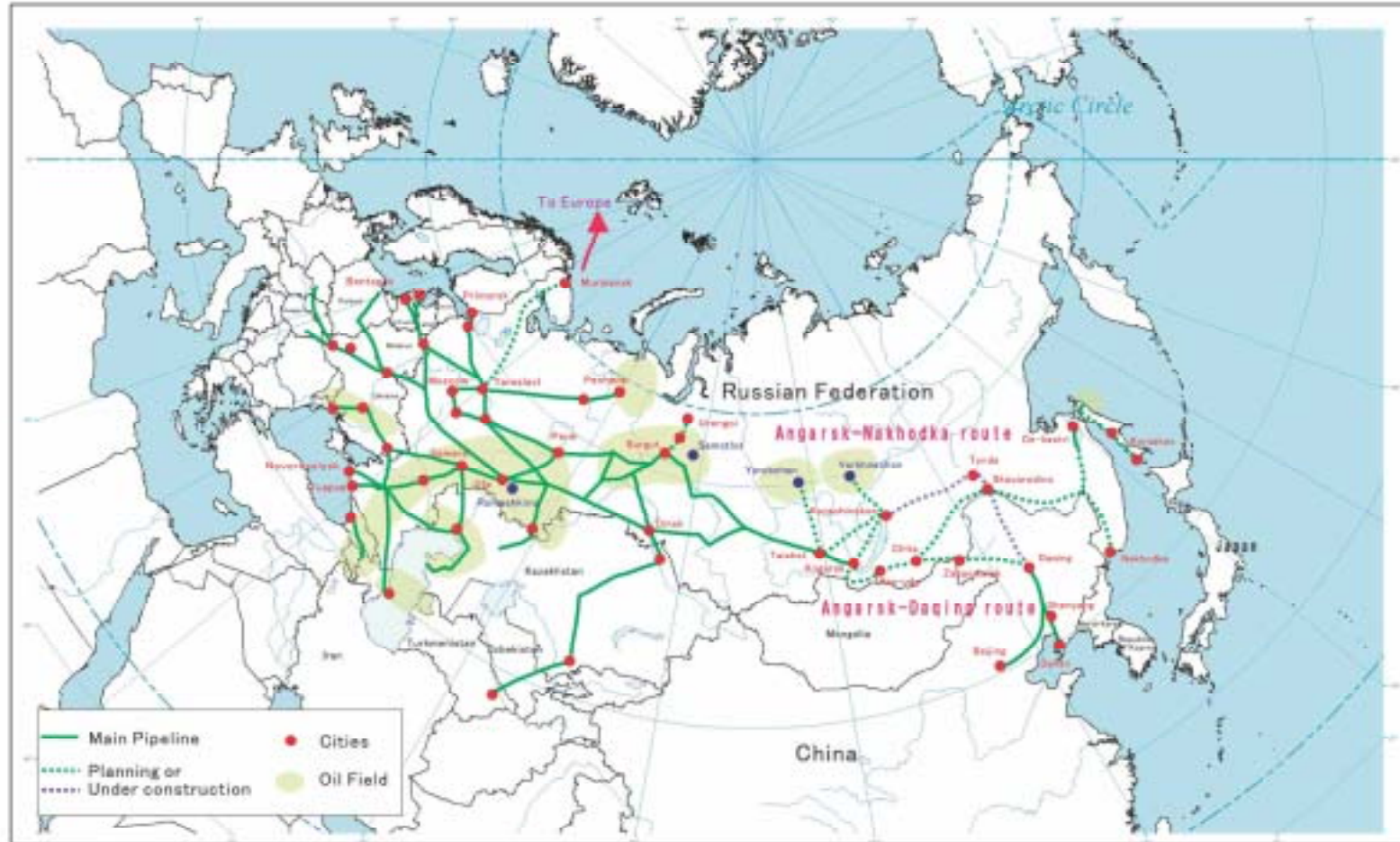
The Russian government has conventionally managed oil exports under monopolistic management by a state-run oil pipeline company. But, the government is expected to carry out these infrastructure construction projects strategically by carefully taking into account such issues as economics of individual export projects, diplomatic consideration paid to its relations with the U.S., Europe, China, Japan and others, and the management of export infrastructure systems at home within Russia.

---

<sup>9</sup> Among the Asia-bound pipeline projects, it was the China-bound one that took a lead. But, the situation set to change as Japan expressed support to the Nakhodka-bound pipeline project when Prime Minister Koizumi visited Russia in January 2003.

<sup>10</sup> This means the so-called "Asian Premium." Since 1990 the Mideast crude oil prices in the Asian market have been higher by about \$1/bbl on average than in the American/European markets.

Fig. 2 Major Oil Pipelines in Russia and on the Caspian Sea



**(3) Natural gas development: current situation and outlook**

Russia has the world's largest natural gas resources<sup>11</sup> and, as of 2001, is the second largest gas producer after the U.S. Russia's gas output, having mildly declined amid social/economic confusion and stagnation after the disintegration of the Soviet Union, plunged to 595.4 billion cubic meters (bcm) by 1995. Unlike crude oil production, gas output has remained flat in the subsequent years with 595.3 bcm produced in 2002.

As a result of greater crude oil production in the last few years, associated gas production by oil companies has gradually increased. But it is Gazprom<sup>12</sup> that is responsible for about 90% of gas produced in Russia. In 2001 Gazprom produced 512.0 bcm, of which nearly 90% came from West Siberia, particularly the super-giant gas fields of Yamburg, Urengoi and Medvezhye. These three giant gas fields have already matured and are approaching their depleting period, while Zapolyarnoye, another giant gas field in West Siberia, was put onstream in October 2001<sup>13</sup>. Production from these principal gas fields is expected to help stabilize and maintain gas output by Gazprom, and ultimately by Russia as a whole.

It appears future trends in Russia's natural gas production will greatly depend on the future development of domestic gas use and exports. At present Russia ships about 70% of its gas output to the local market. But, the domestic gas price, set much below the international market price<sup>14</sup>, has become a serious problem and is squeezing Gazprom's management. The Russian government already announced a plan for phased gas price increases. But, because gas accounts for the greater part of domestic energy consumption, to hike the gas price is not easy in political terms<sup>15</sup>. For this reason, a huge cloud is hanging over the future course of domestic gas consumption. On the other hand, while there is a plan for substantial expansion of shipments to Europe, the main export market for Russian gas<sup>16</sup>, market liberalization under way there makes the chance for long-term gas deals ever more uncertain. From now on, Russian gas development is expected to shift to frontiers where a staggering development cost is involved. This adds to the already growing uncertainty over long-term deals, which can dim the prospect for investment returns and leave gas development little in progress<sup>17</sup>. Under such circumstances, Gazprom, the biggest gas firm, has been taking a prudent

---

<sup>11</sup> BP Statistics puts Russia's proven natural gas reserves as of late 2001 at 476 trillion cubic meters, responsible for 31% of the world's total.

<sup>12</sup> As of March 2003 the Russian government holds 51% of the equity of Gazprom.

<sup>13</sup> Many of Russia's huge gas resources are situated in frontiers, and the Zapolyarnoye gas field is counted as the last giant gas field developable for an identical cost to the three precedents.

<sup>14</sup> In terms of an estimated average as of 2001, the domestic selling price is less than one-tenth of the export price.

<sup>15</sup> Russia is slated to have a parliamentary election at the end of 2003 and the presidential election in 2004.

<sup>16</sup> According to Gazprom, Europe-bound gas exports can swell from 131.8 bcm in 2002 to 175~205 bcm from 2007 onward.

<sup>17</sup> For example, in relation to a gas development project in the super-gas-rich Yamal Peninsula of which output will be exported to Europe, they say scant progress has been made in building the Russian portion of the proposed

stance toward development. For the time being, the company is likely to keep its gas output almost flat at present levels (530~550 bcm). On the other hand, because gas production by oil companies is growing along with crude oil output increases, Russia's total gas output will be on the moderate rise. In addition, materialization of new export projects, if any, can spur gas output in parallel with project progress.

#### **(4) Natural gas export pipeline projects and future subjects**

Russia's gas exports have been on a moderate rise since the second half of the 1990s. In 2002 exports reached 212.2 bcm (up 11% over 1995). Of this, 131.8 bcm went to Europe and 80.4 bcm to the CIS countries. While previously the CIS countries were the main destination, the shift to Europe, a more important source of hard currency revenues, has advanced steadily during the 1990s. As of 2001 gas export revenues amounted to \$17.8 billion, accounting for 18% of the country's total export values. Currently gas is exported to the European market chiefly from the West Siberian gas fields through such trunk pipelines as Northern Light and Bratstvo (Fig. 3). Among others, a newly built undersea pipeline, "Blue Stream," running across the Black Sea to Turkey was put on stream in December 2002<sup>18</sup>. Turkey-bound exports through this pipeline started in 2003 with an initial throughput of 2 bcm, which is slated to reach 16 bcm by 2008<sup>19</sup>.

On the other hand, because strong gas demand growth is likely in Europe as a whole, Russia (i.e. Gazprom) is going to undertake new giant pipeline projects in the hopes of booting its exports. One of them is the "Yamal Pipeline" (capacity: 52 bcm), which links the Yamal Peninsula to Germany at an estimated cost of \$25~28 billion in total investment. But, due to the aforesaid uncertainty resulting from the increasingly freed European gas market, Russia has become more prudent towards large scale investment. Some say construction of the Russian portion (within the Yamal Peninsula area) of the proposed pipeline has not progressed very far.

More lately various moves have been surfacing among the projects to export Russian gas to the Asian market. In Sakhalin, for instance, in regard to Sakhalin 2, a LNG export project, Tokyo Gas announced February 2003 that the company entered official talks on its plan for importing one million tons a year from 2007 onward<sup>20</sup>. As for Sakhalin 1, a pipeline export project, Exxon Mobil, which leads the consortium for the project, unveiled, also in February 2003, that the pipeline route of

---

pipeline due to the uncertainty over the European market, etc.

<sup>18</sup> This project is a 50:50 joint venture with ENI of Italy under a strategic alliance.

<sup>19</sup> However, the gas exports to Turkey through Blue Stream PL halted on March 2003 due to the economic stagnation and weak gas demand in Turkey.

<sup>20</sup> Tokyo Gas agreed to buy 1.1 million tons of LNG on May 2003, followed by the agreement made by Tokyo Electric Power Company (1.2 million tons) on March 2003 and Kyushu Electric Power Company (0.5 million tons) on July 2003.

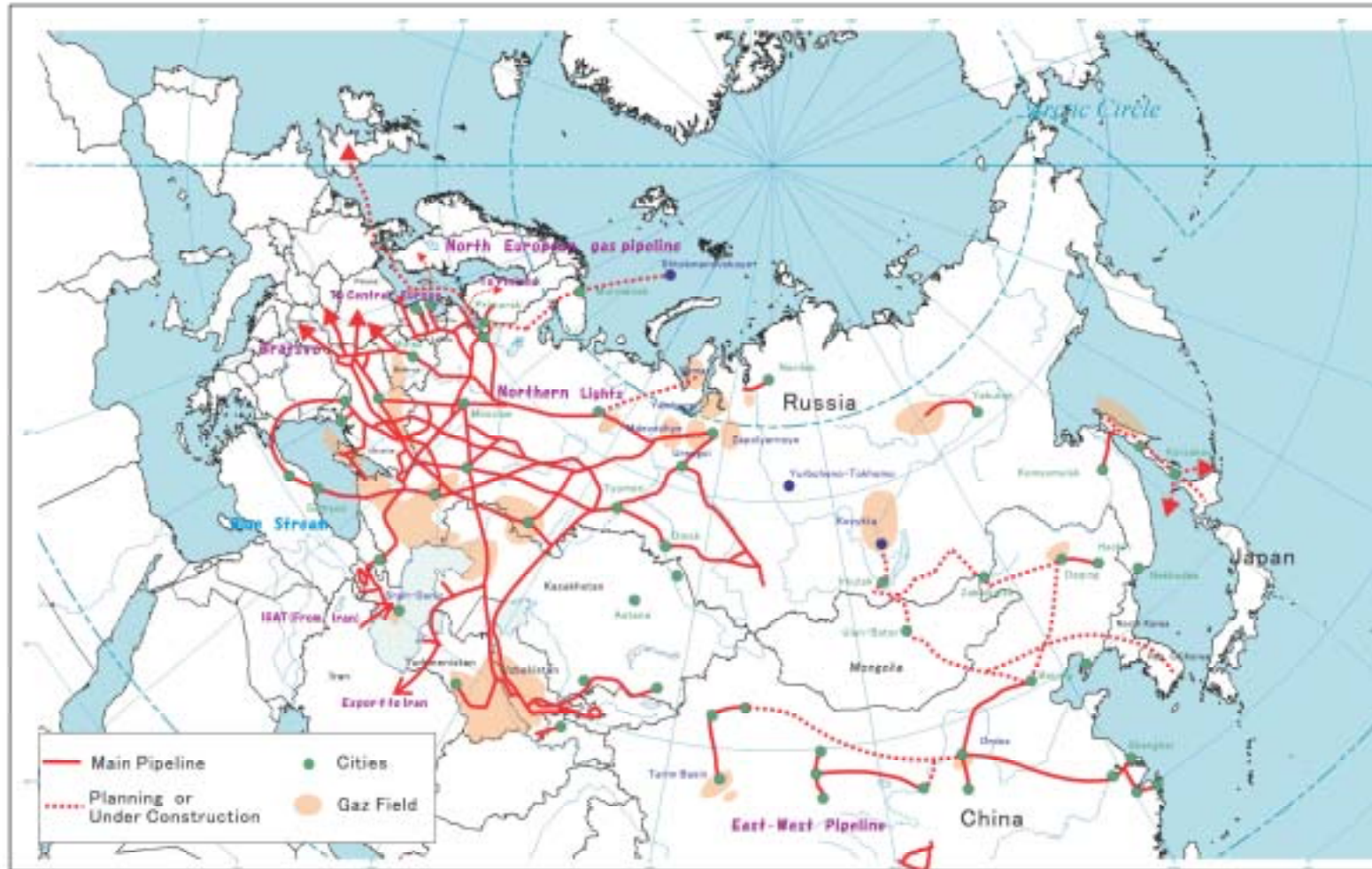
its choice was the “Pacific Route” running from Sakhalin to the Kanto area<sup>21</sup>. Among others, there is a big project to export 30-bcm gas to the Chinese market through an approximately 2,500km-long pipeline originating from the Kovykta gas field in East Siberia (Irkutsk) to Beijing. Yet many believe that whether or not this project eventuates is dependent on China, as China is currently placing greater emphasis of domestic projects – eg. “West Gas to East Pipeline”

---

<sup>21</sup> See Platt’s Oilgram News February 7, 2003



Fig. 3 Major Natural Gas Pipelines in Russia and on the Caspian Sea



Given such factors as the huge initial investment cost involved in gas development and infrastructure construction in the Russian frontiers and the mounting uncertainty over the security of demand due to gas (and electricity) market liberalization, for these new gas export projects to eventuate will not be an easy task. Yet, it is projected that gas will show the strongest demand growth among the primary energies, Russia is likely to take a long-term strategy to broaden its outlets, particularly in the European and Asian markets, and try to advance these projects while carefully watching individual market trends.

## **Chapter 2 Kazakhstan's Oil/Gas Development and Future Prospects**

### **(1) Oil development: current situation and outlook**

Kazakhstan's crude oil production, the second largest after Russia during the former Soviet era, kept steadily decreasing during the first half of the 1990s in the midst of social turmoil/economic stagnation resulting from the demise of the Soviet Union<sup>22</sup>. But, after bottoming out at 410,000 B/D in 1994, Kazakh crude oil production has kept rising and reached 940,000 B/D by 2002. This output rise can mainly be attributed to sharply growing production from Tengiz, the largest-class oilfield in Kazakhstan, of which development is being carried out by Tengiz Chevroil, a joint venture incorporated in 1993 by the Kazakh government and the then Chevron (present Chevron Texaco). Output from Tengiz, a mere 30,000 B/D as of 1993, surged to 260,000 B/D as of 2002, holding the largest share, or 28%, of total Kazakh oil production.

Tengiz Chevroil has a plan for investing an additional \$3.5 billion in Tengiz oil development to increase production to 400,000 B/D by 2005 and further to 700,000 B/D by 2010. However, because the Kazakh government has lately intensified its move to change fiscal conditions to the disadvantage of foreign capital investment<sup>23</sup>, Chevron Texaco, the leading shareholder, announced November 2002 that the company would postpone the aforesaid oil development investment plan. Despite this element of uncertainty, this project is so important that there is can be achieved a good chance that some compromises between the government and foreign capital. Therefore, even if delayed, increasing oil flows from Tengiz are very likely to occur.

On top of Tengiz, Kazakhstan has sizeable and already-confirmed commercial discoveries, with the Kashagan oilfield<sup>24</sup> and the Karachaganak oil/gas field<sup>25</sup> waiting for full-scale

---

<sup>22</sup> Also, during the Soviet days Kazakhstan had no choice but to depend on Russia's pipeline system when exporting its crude oil. But, after the Soviet Union fell apart, Russia restricted the Kazakh crude oil export quota, which was partly responsible for depressing production itself.

<sup>23</sup> For example, the Kazakh government urges to change the way of offering \$3.5-billion investment funds from what was agreed under the original contract.

<sup>24</sup> The Kashagan oilfield's proven reserves are put at an estimated 7-9 billion barrels.

development. Though affected by the aforesaid changes/hardening of foreign capital policy by the Kazakh government, these giant projects will no doubt be undertaken sooner or later in the future. For this reason, there is a strong chance that Kazakh crude oil output will continue to grow sharply in the future. If the principal projects cited above progress favorably, the country's crude oil output should reach around 2.00 MMBD by 2010 and continue to increase thereafter.

## (2) Oil export pipeline projects

Along with crude oil output, Kazakhstan's crude oil exports have also grown sharply and reached 720,000 B/D in 2002, up from 190,000 B/D in 1994. Because Kazakhstan is remote from major oil-consuming markets, and because it is a landlocked country, the security of export routes is a matter of crucial importance. In other words, the recent surge in crude oil exports has been closely related to progress made in export infrastructure construction.

Traditionally Kazakh oil exports have completely relied on Russia's pipeline system (Fig. 4). The principal export route has been the pipeline running from Atyrau to Samara in Russia (present capacity: 300,000 B/D). During the first half of the 1990s, Kazakh crude oil production itself slumped whenever Russia restricted the crude oil export quota for Kazakhstan, and thus troubles of the Russian pipeline system, if any, have delayed the development of the Kazakh oil sector.

Therefore, because the Tengiz development was expected to help expand the country's oil production, the Kazakh government began developing an export route that could be beyond the direct control of Russia and got it completed in November 2001. It is the Caspian Pipeline Consortium (CPC) project. Thanks to the start of the CPC pipeline operation, both production from the Tengiz oilfield and exports swelled considerably in 2002. In this sense, the completion of the CPC pipeline marked an important milestone in the development of the Kazakh oil sector and ultimately the development of the country's economy as a whole.

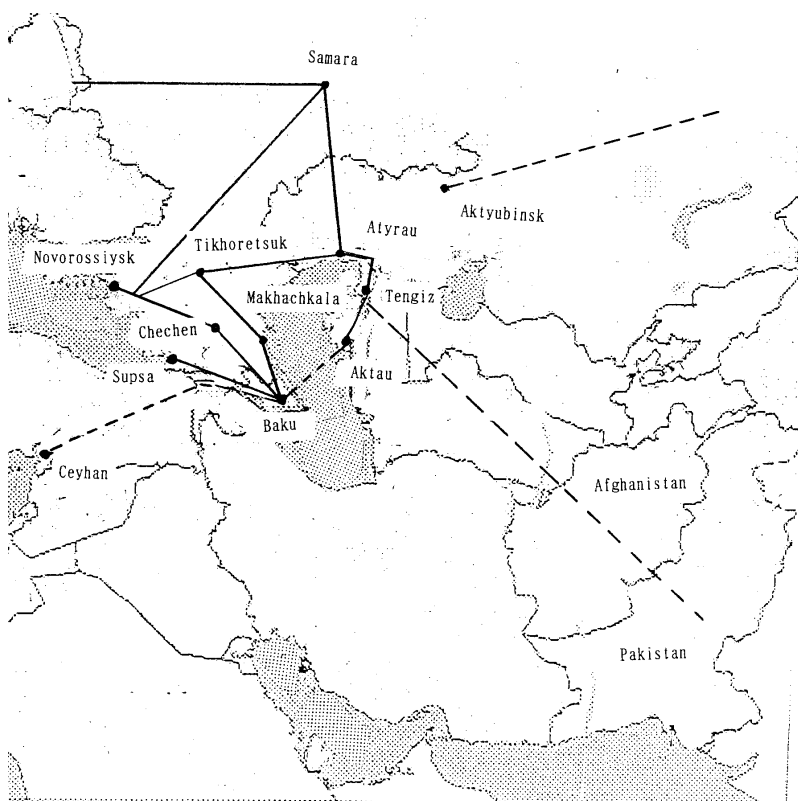
At present the CPC pipeline is capable of transporting 560,000 B/D, larger than current oil flows from Tengiz. But, because sharply growing production from the Tengiz oilfield is likely, there is a plan to increase the pipeline capacity to 760,000 B/D in 2003, 1.17 MMBD in 2011 and further to 1.34 MMBD by 2015. Also noted is the changing attitude of the Russians, who once restricted Kazakh crude oil exports by taking advantage of the export quota they issued. As a precondition of capacity expansion of the Baltic Pipeline System described in Chapter 1, the Russians negotiated with the Kazakhs for their greater use of the Russian pipeline. As a result,

---

<sup>25</sup> The Karachaganak fields' proven reserves are put at an estimated 2.3 billion barrels for oil and an estimated 16 trillion cubic feet for natural gas.

there are growing exports through the existing Atyrau-Samara pipeline as well, of which capacity expansion is also under consideration. Meanwhile, the consortium engaged in the development of the highly promising Kashagan oilfield made a 15% equity participation in the principal export pipeline project (capacity one million B/D) originally designed for the Azerbaijani AIOC project, which will be described in Chapter 3. This move means the consortium has secured an additional export route option for from the Kashagan oilfield.

**Fig. 4 Major Crude Oil Export Pipelines in the Caspian States**



(Source) Prepared by IEEJ.

(Note) The pipeline routes illustrated here are roughly sketched and do not necessarily accord with actual routes. The solid lines represent “existing” pipelines, while the dotted lines those “under planning.”

While searching for non-Russian routes, Kazakhstan considered various export options. They include a new China-bound pipeline project<sup>26</sup> and a swap scheme with Iran, which is

<sup>26</sup> In 1997 the two countries signed an agreement on FS implementation on this pipeline project. But, by September 1999, the FS was halted on grounds of a projection that 20 million tons, the least throughput to assure the pipeline’s economic feasibility, could hardly be secured.

associated with a new pipeline construction project<sup>27</sup>. But, due to difficulties in such points as economics and the U.S. steadfast opposition, these projects actually have advanced little so far. Yet, capacity expansion of the CPC pipeline has become a realistic project and exports through the existing pipelines have been growing in reflection to a favorable turn in the relations with Russia. Given these recent moves, among others, Kazakhstan appears to have secured a sufficient infrastructure capacity for its oil exports at least up to around 2010<sup>28</sup>. Accordingly, the strong likelihood is that crude oil production and exports will keep expanding hand in hand.

### **(3) Natural gas development/exports: current situation and outlook**

In 2002 Kazakhstan produced 11.3 bcm of natural gas, only about one-50th of Russian gas output. Examining Kazakhstan's gas supply-demand balance as of 2000, its output amounted to 11 bcm, compared with 4.8-bcm exports, 3.9-bcm imports and 8.4-bcm consumption. The reason for exports-imports coexistence is that, because the domestic gas-producing areas are located far from major consuming areas (in the eastern part), it is rational for the Kazakhs to import gas to the consuming areas chiefly from Uzbekistan and export surplus gas through the Russian pipeline system.

The greater part of present gas production comes from the Karachaganak field. The Kazakh government, though having underlined oil development in Tengiz, etc. throughout the 1990s, has gradually turned its eye to natural gas development partly for putting resources to effective utilization. By 1999, the government amended the Underground Resource Act, which required those who planned oil development to get a natural gas utilization project integrated into their plan. Partly because Karachaganak has been developed in this way, Kazakhstan's gas production swelled from 4 bcm in 1994 to 11.3 bcm by 2002. Moreover, on the assumption of enhanced development of Karachaganak and Tengiz and full-scale development of Kashagan, the government unveiled in August 2001 a plan for a little more than quadrupling the country's gas output to 34 bcm by 2005 and to 47 bcm in 2010 from present levels. This plan may sound very ambitious but it appears certain that the country's gas output will grow sharply along with progress in the three giant projects.

When exporting its gas, Kazakhstan so far has used a 1400km-long pipeline capable of moving 99 bcm, which originates from Dauletabad in Turkmenistan, across Kazakhstan and reaches Alexandrou Gai in Russia (Fig. 5). However, because this pipeline is a system originally designed

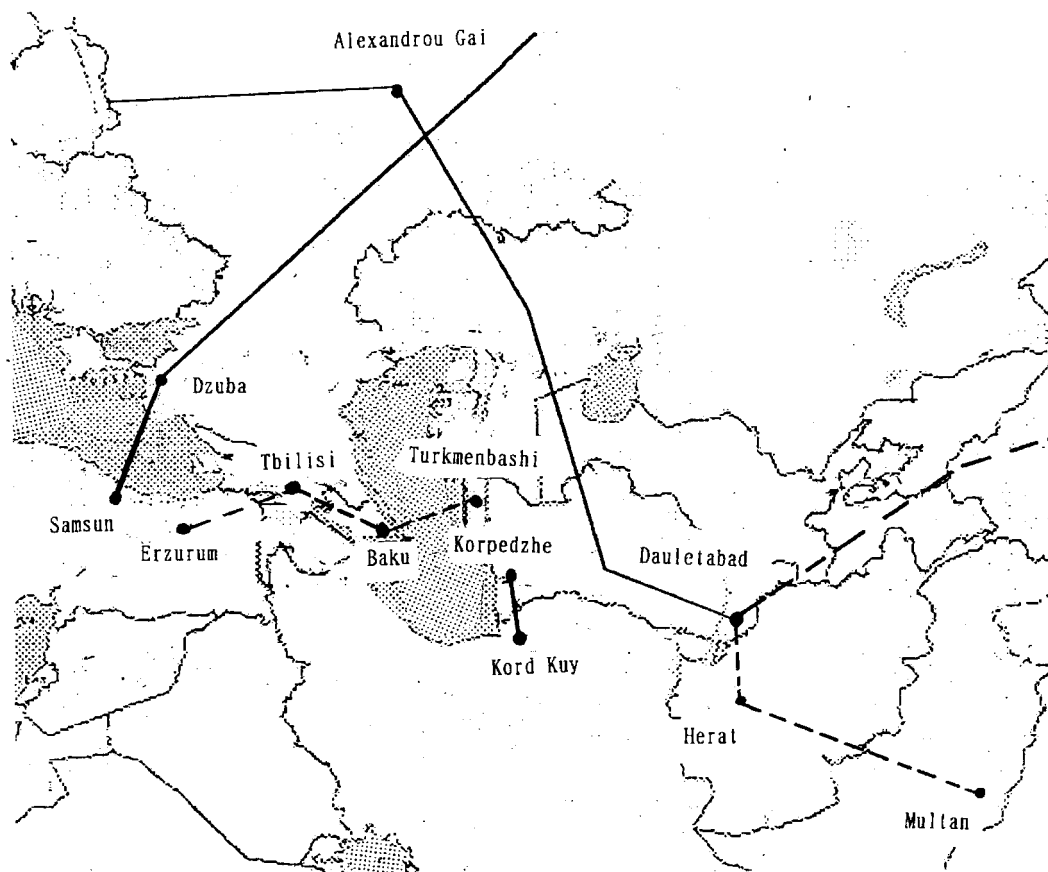
---

<sup>27</sup> A project considered was to pipeline 800,000 B/D of Kazakh crude oil across Turkmenistan to Iran, then, in a swap deal, export an equivalent amount of Iranian crudes from the Persian Gulf.

<sup>28</sup> Russia's existing pipeline system is not provided with a "Quality Bank System" to adjust different qualities of different crudes to be pipelined. For this reason, a sort of segregation is reportedly in practice, with the CPC pipelining high-quality crudes, like Tengiz, and the existing line to Samara moving low-quality ones.

to transport Turkmenistan’s gas to Russia, Kazakh gas shares only a marginal role. In June 2002 the Kazakh government established Kazrosgaz, a 50:50 joint venture between Kazmunaigaz and Gazprom of Russia in order to promote gas exports from now on. Through the newly established joint venture, it is planned to export through the existing pipeline system part of incremental gas output from Karachaganak, among others. Yet, because Turkmenistan’s gas continues to be the mainstream of the throughput of the pipeline<sup>29</sup>, and because new export pipeline projects are absent right now, expansion of gas exports should remain rather modest in volume.

**Fig.5 Major Natural Gas Export Pipelines in the Caspian States**



(Source) Prepared by IEEJ.

(Note) The pipeline routes illustrated here are roughly sketched and do not necessarily accord with actual routes. The solid lines represent “existing” pipelines, while the dotted lines those “under planning.”

<sup>29</sup> For example, Turkmenistan concluded an agreement to supply 250-bcm gas in 2002~2006 to Ukraine, which would be shipped through the pipeline.

### Chapter 3 Azerbaijani Oil/Gas Development and Future Prospects

#### (1) Oil development: current situation and outlook

Azerbaijani crude oil production remains as low levels as in the former Soviet era, or a mere 240,000 B/D as of 1991 when the country became independent. Sluggish production has lingered in the subsequent years. But, from November 1997 onward, when the Azerbaijan International Operating Consortium (AIOC) project<sup>30</sup>, signed in 1994, put on stream, production has been on the gradual rise. In 2002 crude oil output reached 310,000 B/D. Of it, AIOC produced 130,000 B/D. Thus, AIOC has contributed much to recent incremental output<sup>31</sup>.

The blocks subject to AIOC development are divided into the three of Azeri, Chirag and Gunashli deep-sea sections. Currently, as an early-phase activity, production from the Chirag oilfield is under way. In the days ahead, with the Azeri oilfield and the Gunashli deep-sea section developed in three phases, production is planned to reach a peak level of one million B/D by around 2010. At present the development project is progressing favorably, which almost assures constant output increases ahead. Meanwhile, according to the AIOC production plan as of now, production will set to decline after reaching a peak in around 2010. But, in realistic terms, to keep the production level at around one million B/D after 2010 appears quite possible<sup>32</sup>, partly because additional reserves can be expected within the development blocks and neighboring areas.

While the AIOC project has been steadily progressing well, Azerbaijan has another subject crucial to the future of its oil development. That is, aside from AIOC and Shah Deniz, another gas development/export project described later, Azerbaijan has few promising commercial discoveries within its offshore territories in the Caspian Sea<sup>33</sup>. In order to realize greater crude oil output increases than projected by the AIOC production outlook and further propel economic development by virtue of oil development/export expansion, additional oilfield development is imperative. Given the aforesaid objective, the government is required to keep a stable and reliable foreign capital policy and, at the same time, establish more attractive conditions/environment for foreign capital than offered by rivaling oil-producing countries within the region. Among others, while a dispute broke out between Iran and Azerbaijan as well as between Turkmenistan and Azerbaijan over

---

<sup>30</sup> With BP acting as the operator, a 10-company international consortium manages the AIOC project. Lukoil, the third largest equity holder, announced in November 2002 that the company would sell the whole of its equity (10%). In following December, Inpex of Japan expressed it would buy the stake from Lukoil.

<sup>31</sup> Meanwhile, the whole of non-AIOC output came from onshore and offshore oilfields operated by state-run SOCAR.

<sup>32</sup> This view was expressed by many interviewed during our overseas survey conducted under this research project.

<sup>33</sup> In Azerbaijan a total of 21 production sharing agreements have been signed so far. But, only two of them, AIOC and Shah Deniz, have made commercial discoveries and an increasing number of foreign capital pulled out after failed exploration.

territorial waters that contains a promising development block in the Caspian Sea<sup>34</sup>, solving this issue of territorial sovereignty is also a matter of vital importance in the long run.

Yet, judging from the present situation, it appears almost certain that Azerbaijani crude oil production will be on the constant rise in the years to 2010 and reach a level of slightly higher than one million B/D<sup>35</sup>. Additional sizeable discoveries, if any in the future, could further bring about extra crude oil production.

## **(2) Oil export pipeline projects**

As the Azerbaijani crude oil output increase got into stride together with the start of AIOC production, export routes to get incremental crude oil to the international market have surfaced as a crucial issue. As in Kazakhstan described in Chapter 2, autonomous economic management has become a top priority for Azerbaijan since its independence in 1991 and to expand oil exports was positioned as the most important strategic means to that end. Because Azerbaijan too is distant from major oil-consuming countries and because it is a landlocked country without ready ocean access, to install export infrastructure by selecting right options is among one of the top priorities for the nation.

During the days immediately after AIOC started production, Azerbaijan has used the “North Route” (capacity 100,000 B/D) which runs from Baku (Azerbaijan) to Novorossiysk (Russia). Then, with the “West Route” (capacity 150,000 B/D) running from Baku to Supsa (Georgia) put onstream in April 1999, transportation of most of the crude oil pumped by AIOC was shifted to the newer pipeline (Fig. 4 shown above). Perhaps the shift resulted from careful consideration about such issues as Russia’s influence on the North Route and different-quality crudes getting mixed. But, as AIOC set to enter the stage of enhanced output rises, it became imperative to select an export pipeline of Azerbaijan own. A number of options have been under examination and, after adjustments made among the countries and companies concerned, it was decided in November 1999 to construct the BTC Pipeline (1,760 km in total length, one million B/D in capacity), which will run from Baku to Ceyhan (Turkey) across Tbilish (Georgia). This pipeline decision probably reflects such factors as that the Azerbaijani government and its backer, namely the U.S. government, supported a route least influenced by Russians and that Turkey on its part endorsed the BTC as a route that could avoid busy traffic through the Strait of Bosphorus.

---

<sup>34</sup> Given exploration activity in the Alov block, where BP acts as the operator, Iranians claimed the block was located within their territorial waters and sent a gunship for warning purpose, which consequently urged BP to halt the exploration activity.

<sup>35</sup> Beside present production by state-run SOCAR, oil (condensate) production from Shah Deniz slated to shift to the development stage, can be counted as additional output.



The nearly \$3-billion BTC project in total investment has been advancing favorably virtually as planned, with construction/completion slated to accord with progress in the development phases of the AIOC project<sup>36</sup>. Thus, thanks to export infrastructure construction under way at an identical pace to upstream development, Azerbaijani crude oil exports are likely to keep expanding favorably ahead. Meanwhile, in September 2002, four corporate participants in the consortium to develop the Kashagan oilfield in Kazakhstan acquired a 15% stake in the BTC Pipeline<sup>37</sup>. The acquisition enabled these corporate participants in the Kashagan project to secure an option to use 15% of the BTC pipeline in shipping crude oil produced from the Kazakh oilfield.

For the present, there is no concrete new construction project for oil export other than the BTC Pipeline. But, the existing “North Route” and “West Route” alike are available, which means at least a total of 1.25 MMBD of oil export capacity from Azerbaijan is secured as of 2010. While watching future developments, such as AIOC output increases, production trends by state-run SOCAR, the state of oil (condensate) production from Shah Deniz, the equity held by the Kashagan corporate participants and the possibility of new oilfield development, Azerbaijan could move to further strengthen its export infrastructure capacity, if necessary.

### **(3) Natural gas development/exports and outlook**

In Azerbaijan, gas development has been rather inactive so far, and gas output remained at around 5.2 bcm as of 2002. During the former Soviet years, the country had imported gas from Russia. Entering the 1990s, however, the imports have plunged sharply to nil in 1997<sup>38</sup>. In this context, Azerbaijan has been in the state where the evolution of gas development/use has been behind that of oil.

But, the situation changed drastically in July 1999 when BP, the operator of Shah Deniz Project, announced a giant gas find under the project on which agreement was signed in 1996. Namely, on top of oil, natural gas is now counted as an important export commodity and becomes subject to strategic development. Based on the huge reserves estimated as much as 700-bcm, negotiations started to export gas to the Turkish market then expected to have a strong gas demand growth from this project<sup>39</sup>. Thus, in March 2001 Azerbaijan and Turkey signed a 15-year agreement on gas supply and purchase. Under the original plan, the exports (2 bcm) were

---

<sup>36</sup> According to our overseas interview survey, completion of the BTC Pipeline is scheduled by 2005 when the first phase of AIOC, or crude oil production from the Azeri oilfield, will start.

<sup>37</sup> The four companies are ENI, Total Fina Elf, Conoco Philips and Inpex.

<sup>38</sup> Meanwhile, lately Azerbaijan resumed gas imports and agreed to import 5.5 bcm from Russia in 2003.

<sup>39</sup> By the way, in regard to gas exports to the Turkish market across the Caspian Sea, there was a preceding project, that is, the Trans Caspian Pipeline Project to export gas from Turkmenistan via Azerbaijan through the Caspian undersea pipeline. But, given changing situations, particularly the gas find in Shah Deniz and the improving

scheduled to start in 2004 and increase to a peak level of 6.6 bcm by 2007. But, due to the sluggish economy of Turkey as well as fierce competition with rivaling major gas-producing countries<sup>40</sup>, it was decided to postpone the start of pipeline operation to 2006.

The consortium of this project officially approved the first phase of gas field development in February 2003. The first phase costs \$3.2 billion in total investment and is expected to have a peak output of 8.4 bcm for natural gas and 40,000 B/D for condensate<sup>41</sup>. Meanwhile, Statoil of Norway was named as the operator of the pipeline sector. Thus, this project has entered into the full-scale development/construction stage.

In the meantime, the pipeline route of this project covers 1,000 km in total length from Baku to Erzurum (Turkey) via Tbilish (Georgia) (Fig. 5 shown above). In the longer run, extension/linkage<sup>42</sup> of the pipeline is planned in hopes to reach Greece, and ultimately the European countries, as export targets. Thus, while the Shah Deniz gas export project started initial moves, gas exports to Turkey and beyond, namely Europe, are the least easy undertakings to realize from the aspect of market/outlet security. As far as shipments to Turkey are concerned, there is the worry that even the already signed contract volume will glut the Turkish market due to sluggish demand there. As for those to Europe, further progress expected in energy liberalization can intensify the uncertainty over stable takes/demand security. Still worse, there will be fiercer competition with rivaling gas-producing countries, notably Russia. In order to diversify export items and the economy and increase non-oil export revenues, a matter of crucial importance for Azerbaijan for the present is to make concentrated efforts for securing/expanding exports to Turkey closely related in both historical and cultural terms<sup>43</sup>.

#### **Chapter 4 Impacts on the International Energy Market**

As discussed in the preceding chapters, Russia, Kazakhstan and Azerbaijan all are expected to record constant rises in oil/gas production and exports. Between 2002 and 2010 crude oil production is projected to go up from 7.66 MMBD to 10.00 MMBD in Russia, up from 940,000 B/D to 2.00 MMBD in Kazakhstan, and up from 310,000 B/D to 1.00~1.20 MMBD in Azerbaijan. As for gas, moderate output rises are likely for Russia from about 600 bcm at present. The Kazakh gas

---

Turkmenistan-Russian relations on gas exports, the preceding project was not realized.

<sup>40</sup> For example, Russian gas supplies started through the "Blue Stream," an undersea pipeline across the Black Sea put on stream in December 2002. But the gas exports halted on March 2003 because of the weak demand in Turkey.

<sup>41</sup> In comparison, peak gas output in the second phase is reportedly put at 16 bcm.

<sup>42</sup> In March 2002 Turkey and Greece signed an agreement to get their pipelines linked.

<sup>43</sup> According to our overseas interview survey, about 80% of the agreement with Turkey are reportedly subject to the take-or-pay clause.

production is expected to swell from 11.3 bcm in 2002 by about 3~4 times by 2010, which chiefly reflects greater production from Karachaganak. In Azerbaijan, having produced 5.2 bcm in 2002, an additional output of about 8-bcm-strong is expected from Shah Deniz alone.

In case of crude oil, a higher estimate puts that, when combined, the three countries' incremental output will amount to 4.29 MMBD in 2002-2010. The world's oil demand, if growing at the same rate as in the last decade (up 1.3%/year on average), should increase from 76.80 MMBD<sup>44</sup> in 2002 to 87.40 MMBD by 2010, up 10.60 MMBD in absolute terms. If so, the extra output from the three countries alone could cover about 40% of the incremental demand. Of course, what will be actual incremental production/demand is hard to forecast accurately. Yet, it is almost certain that, as additional new sources, the supply from the three countries is going to fulfill a vital role in meeting growing oil demand in the world in the years to come.

Of increasing importance on the international energy market as newly emerging principal sources, it is hoped that these three countries can curb OPEC's increasing share on the international oil market and restrain the degree of rising market concentration. As a consequence, it is considered effective in checking the OPEC's market control power. On the assumption of abundant reserves held by OPEC, a conventional-wisdom-based popular view puts that a sharply rising market share of OPEC is unavoidable in the long run. Crude oil production from the North Sea and Alaska, having contributed much to lowering OPEC's production share during the first half of the 1980s, is set to decline from now on. Therefore, to what extent the three countries can make their output increases real could have massive impacts on OPEC in various aspects, including its market share, its policy needs for output restriction to adjust supply and demand, and the degree of ease in its policy implementation. Also, if gas development advances worldwide, (including these three countries), and this larger gas supply encourages greater gas use among consuming countries, there is a good chance that the oil demand growth itself could be dampened.

In the meantime, given that Russia, the largest among the three countries, has recorded sharp production rises in recent years to a comparable level to Saudi Arabia, some argue that Russia is set to replace the Saudis. But, from the international oil market's perspectives, the most essential difference between the two producers is that, whatever its capacity expansion is, Russia basically is a producer operating at full capacity and thus remains a "price taker". In other words, unlike Saudi Arabia, Russia will never be a "price maker" backed by fairly large excess capacity and ready for making a supply-demand adjustment, if necessary. After all the importance of Russia is found in

---

<sup>44</sup> The figures for the world's oil demand in 2002 and the demand growth rate over 1992-2002 are taken from the IEA Statistics, including IEA, "Oil Market Report."

the point that it offers a sizeable additional supply source and contributes to diversification of supply sources.

Alerted by recent developments, such as the crude oil price spike since 1999, the 2001 September 11th terrorist attacks on the U.S. followed by intensifying tensions in the Middle East, and the outbreak of the Iraqi war, energy security is gathering growing concern worldwide. Under such circumstances, given the need to diversify supply sources and reduce/curb Mideast dependence as part of diversification efforts, there is a growing recognition that greater oil/gas production and exports from the three countries are a matter of vital importance in strategic terms. This may be true to all major consuming countries across the world, whether it is the U.S., European countries, China or Japan. From now on, on the international energy market, major consuming countries are expected to strengthen moves to fortify their ties with Russia and the Caspian states.

Conventionally, aside from those to the CIS countries, oil/gas exports from Russia and the Caspian states have basically headed for the European market. Certainly the mainstream held by Europe-bound shipments will remain unchanged. But, Russia and the Caspian states on their parts, in recognition of the maturing European market, potentials of the U.S. and North East Asia as new markets and the presence of the crude oil Asian Premium, among others, show conspicuous moves to search for tapping new outlets. To which markets these new suppliers export their oil/gas can have crucial impacts on a supply-demand balance in each market, reliance on a specific supply source (the Middle East), etc. that their future trends should carefully be watched.

Also, in these areas, upstream investment, particularly spurred during the days of the high crude oil price since 1999, has contributed to increasing crude oil output. Though a certain time lag is inevitable, the crude oil production surge will eventually form a factor that can work on lowering the crude oil price by increasing supplies to the international oil market. Namely, from the medium- and long-term viewpoints, the oil supply potentials inherent to these areas are expected to function as a market-stabilization mechanism to correct the crude oil price, if jumping above a “sustainable” level.

In case of gas, Europe remains the primary export destination. It means the Russian and Caspian supplies are inevitably exposed to fierce competition with major rivaling exporters (e.g. Norway, Algeria, Nigeria and Libya). As already described, in Europe, because of advanced liberalization of the gas and electricity markets, to gain long-term stable deals, the major premise of conventional gas projects, is becoming harder ever. The areas surveyed this time are extremely rich in gas resources. Yet, resource development in frontiers or remote places from consuming areas

involves huge initial investments. If the advance in liberalization inflames the uncertainty over the security of stable outlets, that is, prospects for stable investment recovery/profitability, investors should take a more cautious stance to gas development investment. As a result, the more capital-intensive gas projects can be hit severely, hampering the speed/degree of progress.

### **Chapter 5 Implications for Japan**

For Japan, which imports virtually the whole of its oil supply, stabilization of the international oil market is a matter of vital importance. From now on, even if not supplied directly to Japan, steadily increasing energy supplies from Russia, Kazakhstan and Azerbaijan, among others, should be considered as contributing to market stabilization and ultimately to Japan's energy security. This is because a greater supply to the international oil market is effective in easing the supply-demand balance, etc.

At the same time, very noteworthy is that these resource-rich countries, above all Russia, are now paying keen attention to the North East Asian market, including Japan, as their new outlet. In the case of Japan, the public and private sectors have made concentrated efforts for diversifying energy supply/import sources. So far certain effects have been felt, typically in lowering oil dependence, but without succeeding in diversification of oil import sources, the Mideast reliance has been upward since the second half of the 1980s as an underlying trend<sup>45</sup>. Also, China, of which oil imports have been ballooning after it became a net importer in 1993, is becoming increasingly dependent on not only oil imports but also the Middle East<sup>46</sup>. In this context, the crude oil export pipeline project, the natural gas pipeline export project and the LNG project, which Russia is about to undertake in East Siberia and Far Eastern Russia, can fulfill a great role as new energy sources and sources of energy import diversification as well. For example, if the crude oil pipeline (one million B/D) from East Siberia to Nakhodka becomes real, with the whole of its throughput imported by Japan, a simple calculation shows that Japan's Mideast reliance should drop by as much as 20 points or so.

Meanwhile, all of these projects are planned in adjoining areas to the North East Asian market. As a result, they are found enshrining a number of potential merits. For example, geographical nearness, like the Sakhalin-Japan case, is expected to allow supply at a more competitive price. In the longer run, these projects are hoped to lead to the formation/development of energy infrastructure networks regionwide. More importantly, it should not be overlooked that to develop

---

<sup>45</sup> In 2002 Japan's Mideast reliance stood at 86% of total crude oil imports.

<sup>46</sup> In 2002 China's crude oil imports were 69.41 million tons (1.39 MMB/D), up 15% over the previous year, with the Mideast reliance staying at 50%.

these new supply sources leads to strengthening the bargaining power against the Middle Eastern producing countries, the prime suppliers at present. It remains unchanged that the Middle East will be the most important energy supplier to North East Asia in the years ahead. Also, from the Middle Eastern perspective, it is an inevitable that North East Asia will become its most important market. While fastening such interdependent relations, the North East Asian countries, including Japan, are required to secure stable energy supplies from the Middle East for more competitive prices/terms than ever. To that end, it is essential for the North East Asian countries to strengthen their bargaining power in the capacity of buyers, and the new energy supplies from Russia can provide them with an extremely practical means to do so.

Meanwhile, from the standpoint of the North East Asian market as a whole, realization of the proposed Russian projects, whichever it is, should be counted as advantageous in adding new supply capacities and diversifying supply sources within the region. Rather, what should be avoided is excessive “competition” among the North East Asian countries, which can be unfolded if individual countries cling to project realization of their own. This sort of disarray can worsen economic conditions of project realization and make the relations among the North East Asian countries sour.

As discussed before, the new export projects to the North East Asian market under consideration in Russia and its neighbors have various merits. But, there are restraints that can hamper realization of the proposed projects in some way. They include (1) the issue of project economics/profitability that is inherent to the project location in frontiers where a huge initial investment is required. (2) The uncertainty over the security of stable demand/lifting derived from energy market liberalization under way in North East Asia too. (3) Political tensions or potential conflicts/distrusts still present among major countries/areas involved in the proposed projects, which include Japan, China, Russia, South Korea, Taiwan and North Korea.

From now on, in order to promote the giant projects to the North East Asian market and realize/enjoy their potential merits, the following points will become imperative. First, all those involved in any of the proposed projects are required to pursue stepped-up efforts/inventions to enhance project economics. On top of this, without sticking to “pure economics” of a given project alone, they have to consider the project from a strategic standpoint of strengthening a bargaining power against the Middle East, an element hardly quantified. Then, in order to pursue merits for North East Asia as a whole, it appears essential for top leaders of individual countries to make high-level commitments so that they can share the “will” to realize and broaden energy cooperation in North East Asia.

Contact: [ieej-info@tky.ieej.or.jp](mailto:ieej-info@tky.ieej.or.jp)