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**REPORT ON GLOBAL ENERGY SECURITY
AND THE CASPIAN SEA REGION**

Note by the secretariat¹

Addendum

COUNTRY PROFILES

1. During its fourteenth session held in June 2005, the Committee on Sustainable Energy welcomed the Statement on Global Energy Security and the Caspian Sea Region issued by representatives of Azerbaijan, Islamic Republic of Iran, Kazakhstan, Russian Federation and Turkey. In their Statement representatives of these countries accepted, inter alia, the proposal of the Energy Security Forum to work together with national experts appointed by the government of each country to convene a seminar to examine energy transport corridors, new infrastructure, transmission systems and investment requirements for increased energy exports from the Caspian Sea Region including conclusions and recommendations on enhanced energy trade and international cooperation.

¹ The present document was submitted late due to resources constraints.

2. The present note was prepared on the basis of the presentations of high-level officials and of national experts appointed by governments made to the high-level Meeting on Energy Security in the Caspian Sea Region in June 2005 and at the Seminar on Energy Security Risk Mitigation and the Caspian Sea Region in April 2006, and using data from the British Petroleum (BP) Statistical Review of World Energy, June 2006, Energy Information Administration (US Department of Energy) and other sources.

3. This note complements the Report on Global Energy Security and the Caspian Sea Region (ECE/ENERGY/2006/3). It provides additional information on the oil and gas industry and the hydrocarbons market in each of the five countries of the Caspian Sea Region referred to above.

Azerbaijan

4. Azerbaijan is a Caspian Sea littoral state with a population of about 8.5 million. Its real gross domestic product (GDP) grew by an extraordinary 25 per cent to about US\$13 billion in 2005 as oil and natural gas prices and production rose, and foreign investors invested in major oil and gas projects. Although the entire fuel sector represented 27 per cent of Azerbaijan's GDP in 2000, it grew to approximately 41 per cent of GDP in 2005.

5. According to the BP Statistical Review of World Energy, Azerbaijan has proven oil reserves of 1.0 trillion tonnes accounting for 0.6 per cent of the world's total and a reserves/production (R/P) ratio of 42.2. Oil production has steadily increased over the last ten years, from 9.2 million tonnes in 1995 to 14.0 million tonnes in 2000 and reached a level of 22.4 million tonnes in 2005. Internal oil consumption over the same period contracted from 6.6 million tonnes in 1995 to 6.3 in the year 2000 and down to 5.1 million tonnes in 2005. With increasing production and lower domestic demand, exports grew significantly over the period.

6. Proven reserves of natural gas at the end of 2005 were estimated at a level of 1.37 trillion cubic metres (tcm), which corresponds to 0.8 % of the world total. Azerbaijan produced 6.2 billion cubic metres (bcm) of gas in 1995 and about 5.3 bcm in 2000 and 2005. Over the period, natural gas consumption first fell from 8.0 bcm in 1995 to 5.4 in 2000 and then climbed back to 8.8 bcm by 2005. Thus, despite significant reserves, Azerbaijan is currently a net natural gas importer through a long-term supply contract with Gazprom.

7. In 2005, the Azerbaijan oil and gas sector had four major projects of significant importance not only for the country's economy but also for the European and world energy markets:

- Full-scale development of the Azeri-Chyrag-Guneshli (ACG) oil field;
- Further development of the Shah-Deniz gas-condensate field;
- Completion of construction of the Baku-Tbilisi-Ceyhan (BTC) export crude oil pipeline, and
- The South Caucasus gas pipeline project Baku-Tbilisi-Erzurum (BTE).

8. By 2010 - 2012 these projects will contribute to significantly raising Azerbaijan's annual oil and natural gas production (according to some estimates, to 60 million tonnes of oil and 20 bcm of natural gas per year). Proven recoverable oil reserves of the Azeri-Chyrag-Guneshli

(ACG) field alone are estimated at about 1 billion tonnes, plus 120 bcm of natural gas and 8 million tonnes of gas-condensate. The total investment for the development of the ACG field is expected to be about US\$ 10 to 12 billion. Some 40 million tonnes of crude oil and 8 bcm of natural gas have already been produced from this field since it was commissioned in 1997.

9. The proven reserves of the large Shah-Deniz gas-condensate field are estimated by national experts on the level of 1.0 tcm of gas and over 150 million tonnes of condensate. About US\$ 4.0 billion will be invested during the first stage of development of this field. A modern double-function offshore platform for drilling and production will be installed at a sea level of 100 metres.

10. Since other areas of the Caspian Sea, offshore Azerbaijan, are also very promising for new oil and gas field discoveries, the construction of an efficient and reliable pipeline network to bring Caspian oil and gas to the European and world markets has become a priority for Azerbaijan.

11. The first delivery of Azeri oil to world markets took place in October 1997 when the 1400 km long Baku – Novorossiysk pipeline was commissioned with a yearly delivery capacity of 6 million tonnes. The next step was the construction of the 850 km Baku – Supsa pipeline, commissioned in April 1999, with a design capacity of over 6 million tonnes per year. In 1999, the Presidents of Azerbaijan, Georgia, Turkey and Kazakhstan signed the “Istanbul Declaration” which defined the major parameters of the Baku – Tbilisi – Ceyhan (BTC) project aimed at the construction of an international pipeline, with a total length of 1768 km and a design capacity of 50 million tonnes per year, that would deliver Caspian crude oil to the Mediterranean Sea. It was also envisaged that some crude oil from Kazakhstan would be shipped through this pipeline. The BTC project has now been commissioned with delivery of oil to Ceyhan.

12. The South Caucasus gas pipeline connecting Baku, Tbilisi and Erzurum over a distance of some 915 km will bring gas produced at the Shah – Deniz field to Turkey and eventually to European gas markets. Pipeline construction began in late 2004 and will be completed during the first quarter of 2007. British Petroleum and Norway's Statoil each have a 25.5 per cent stake in the project. The State Oil Company of Azerbaijan, SOCAR, Russia's Lukoil, Turkey's TPAO, France's Total, and Iran's NICO have about 10 per cent each. The investment costs are estimated at about US\$1.3 billion and the pipeline is expected to carry over 20 bcm of natural gas per year.

13. At present, the Government of Azerbaijan has signed 25 oil agreements with 35 companies from 15 countries with a total investment volume of over US\$ 70 billion. About US\$ 10 billion have already been invested in developing the oil industry's infrastructure. In order to manage efficiently the revenues from oil and gas exports, the Government of Azerbaijan established the State Oil Fund in 1999 designed to channel funds collected from oil and gas-related activities for education, poverty reduction and for efforts aimed at raising rural living standards. By the end of 2005, the State Oil Fund reported assets of US\$1.3 billion and these are expected to almost double during 2006.

14. Since 1991, the Government of Azerbaijan has been steadily implementing a modern and transparent legal and regulatory framework to promote the development of the national economy and enhance foreign direct investments. Azerbaijan maintains close cooperation with various international organisations in the field of energy including the Energy Charter, BISEC and EU special programmes such as TRACECA and INOGATE among others. It shares growing concerns about emerging regional and global threats to energy security and welcomes the initiative to discuss this issue within the framework of the UNECE.

Islamic Republic of Iran

15. The Islamic Republic of Iran, bordering the Caspian Sea as well as the Persian Gulf in the Middle East, is the only OPEC member among Caspian Sea region countries and the second largest oil producer in OPEC. It also borders all three sub-regions of the Caspian Sea – the Caucasus, Central Asia and the Russian Federation. It is a large crude oil producer with significant proven oil reserves. It currently produces about 200 million tonnes of oil, representing 5.1 per cent of total world crude oil production. With proven oil reserves of 18.9 billion tonnes, about 11.5 per cent of the world's total, the country is likely to be able to significantly increase its oil production in the future as it invests in both existing and new fields including in the Caspian Sea. According to some projections, it could possibly double its oil output over the next 15 to 30 years.

16. The Islamic Republic of Iran is also a major natural gas producer. In 2005 its natural gas production reached 87 billion cubic metres, or 3.1 per cent of the world total. But it is not yet a major exporter, with most production being consumed internally. Its proven reserves are 26.7 tcm accounting for 14.9 per cent of the world's total reserves. These are the second largest gas reserves after those of the Russian Federation and are very large compared to Iran's production. Therefore, it has the potential to significantly increase production if economically viable markets can be developed. As for gas exports, since December 2001, it has been supplying gas to Turkey in accordance with a 25-year agreement for a total volume of 228 bcm. Iranian gas, which amounted to 4.32 bcm in 2005, is transported via 2,577 km of gas pipelines linking Tabriz in the west of Iran with Ankara in Turkey. Also, some 5.8 bcm of gas are imported from Turkmenistan.

17. While Iran is an important oil exporter, it is also a significant energy consumer. Domestic oil consumption has been growing steadily from 60 million tonnes in 1995 to 63.5 in 2000 and reached 78.4 million tonnes in 2005. Domestic natural gas demand has been growing even more rapidly and more than doubled during the last ten years from 35.2 bcm in 1995 to 88.5 bcm in 2005. Currently, natural gas accounts for nearly half of Iran's total energy consumption. The government is planning to make significant investments in the coming years to increase this share. The price of natural gas to residential and industrial consumers is state-controlled and kept at low levels. This has encouraged the rapid growth in natural gas consumption as a replacement for fuel oil, kerosene and liquefied petroleum gas (LPG).

18. Iran is interested in fostering energy trade and cooperation among Caspian Sea countries. As such, it is prepared to import up to 10 bcm of gas from Turkmenistan by 2010 and up to

20 bcm by 2015 as well as 10 bcm from Azerbaijan provided that adequate energy transport infrastructure is available. Iran is also well placed to import Kashagan oil from Kazakhstan.

Kazakhstan

19. The Republic of Kazakhstan is both Central Asia's largest economy and one of the twenty largest oil-producing countries. Over the last ten years oil production in the country has more than doubled. In 2005 oil and condensate production reached a level of 63 million tonnes. Given the large proven oil reserves in Kazakhstan at 5.4 billion tonnes, it is expected that oil production will reach the level of 90 million tonnes in 2010 and over 150 million tonnes of oil by the year 2015.

20. Proved reserves of natural gas in Kazakhstan are 3.0 tcm representing 1.7 per cent of the world total. Kazakhstan produced 26.3 bcm of natural gas in 2005 and it expects to raise production to 52 bcm by 2010 and to about 80 bcm by 2015.

21. Kazakhstan can accommodate rapid growth of hydrocarbon exports since it has abundant oil and gas reserves, relatively low domestic consumption of hydrocarbons compared to the reserve base (consumption of 10 million tonnes of oil and 18 bcm of gas in 2005) and domestic demand that appears to be rising only slowly. With the process of globalisation of the world economy gaining momentum, oil and gas production in the Caspian region has become a strategic issue not only for European consumers, but also on a global scale. Therefore, ensuring the reliable supply of its energy resources to the world market has become a priority for the countries surrounding the Caspian Sea. In order to meet this challenging priority, Kazakhstan's energy policy is oriented towards the development of oil and gas projects as well as the development of reliable oil and gas transportation networks that can accommodate rising exports.

22. KazMunayGas, the State oil and gas Company of Kazakhstan, is currently working on the following existing and prospective export transportation projects aimed at opening up new markets, extending existing export routes and the diversification of transportation networks:

- Extension of the Caspian Pipeline Consortium (CPC) project;
- Extension of the capacity of the Atyrau – Samara oil pipeline;
- Aktau-Baku-Tbilisi-Ceyhan transportation system project;
- Atasu-Alashankou oil pipeline (as a part of the Kazakhstan-China oil pipeline project);
- Extension of “Central Asia – Centre” project;
- Feasibility study of Aktau-Teheran (Kazakhstan-Turkmenistan-Iran) oil project;
- Feasibility study of the construction of the gas pipeline “Kazakhstan – China”;
- Consideration of Kazakhstan's participation in the Odessa-Brody-Plotsk oil pipeline system.

23. Among these many projects, the priority for Kazakhstan is to upgrade the capacity of the Caspian Pipeline Consortium (CPC) project from 30.5 million tonnes in 2005 to 67 million tonnes of oil per year. This is a major export route for the country today. Since its commissioning in 2002, Kazakhstan has supplied over 80 million tonnes of oil through this

pipeline. The second largest operating oil pipeline is Atyrau – Samara from Western Kazakhstan to Russia. It is foreseen to increase its throughput capacity to carry 20 – 25 million tonnes per year.

24. Experts from Kazakhstan and Azerbaijan are currently considering the modalities of a new Aktau-Baku-Tbilisi-Ceyhan (ABTC) transportation system project, which would bring oil via the Caspian Sea to the BTC pipeline. At the end of 2005, a new Atasu-Alashankou oil pipeline was commissioned for supplying oil from Kazakhstan to China at a level of 10 million tonnes per year, with the expectation of increasing the pipeline's throughput capacity to 20 million tonnes per year at some later stage. KazMunayGas is also considering joining the Odessa-Brody-Plotsk project to start deliveries of oil to Eastern and Central Europe and possibly even further to the Baltic and Mediterranean Sea.

25. The development of an efficient and reliable gas transportation system is a key component of Kazakhstan's energy policy. As mentioned earlier, gas production in Kazakhstan is steadily growing and could reach 80 bcm in 2015. Similarly, export volumes of gas are increasing: to 7.6 bcm in 2005 and projected to reach 8.3 bcm in 2010.

26. Based on projected production and consumption of hydrocarbons and bearing in mind its geographical position, Kazakhstan has three major export corridors: the Western, Eastern and Southern corridors. At this time, Kazakhstan is paying particular attention to the Western corridor to serve the European gas market. Kazakhstan has two alternatives for serving this market. The first is an export corridor oriented in a northwesterly direction, using the existing high-pressure pipelines through the Russian Federation. In this case, the "Soyuz" and Oreburg – Novopskov pipelines would have to be upgraded with additional volumes of gas from the Karachaganah gas field and the capacity of the "Central Asia – Centre" gas transmission line would have to be upgraded from 54.8 bcm to 100 bcm per year. Alternatively, the Western corridor to serve the European gas market could be oriented in a south-westerly direction passing through the Caspian Sea and then onto the Caucasus and Turkey or directed in a southern direction through Iran and then on to Turkey. This alternative, whether through the Caucasus or Iran, would require the building of new pipelines.

27. The development of the south-westerly gas transportation network is supported by the EU programme Transport Corridor Europe-Caucasus-Asia (TRACECA). Similarly, the EU member states are sponsoring the INOGATE programme, which supports development of oil and gas export corridors from Central Asian and the Caspian states to Europe (through Russia or through Turkey or both).

28. The rapid economic growth and increased demand for energy in China has brought new opportunities to Kazakhstan in opening up new markets for its hydrocarbon exports. Therefore, KazMunayGaz is seriously considering the construction of an Eastern corridor. For their part, Chinese partners have already built a West – East gas pipeline as part of this future pipeline network.

29. Kazakhstan is successfully developing its oil and gas industries. Projects initiated ten years ago are being repaid, bringing revenues to investors and to the state. Increased oil production has

been complemented with a suitable level of infrastructure development. Strategic decisions for Kazakh oil exports are based on the infrastructure available along various export routes in order to place an optimal load on key pipelines. Such principles provide Kazakhstan with an opportunity to diversify its markets for oil and gas supply and to provide optimum transportation tariffs for Kazakh oil and gas exporters.

30. The large hydrocarbon reserves of the Caspian Sea region and prospects for new discoveries could help to enhance global energy security. One priority issue for the region is securing the efficient export of hydrocarbons to the world energy market. Kazakhstan is particularly interested in maintaining stable and transparent conditions for the transit of energy resources to world markets. In this respect, it regards the Energy Charter Treaty as the only legally binding international accord that stipulates the duties of the Parties regarding the transit of energy resources.

31. The successful implementation of energy projects in the Caspian Sea Region may entail certain adverse environmental consequences. Therefore, it is extremely important to apply the most advanced energy and resources-efficient technologies in order to provide for the sustainable development of the region. This, in turn, calls for increased investment flows of advanced technologies to the Caspian Sea Region countries.

Russian Federation

32. Over the last few years, the Russian Federation has increased oil production significantly, with production rising from 310 million tonnes in 1995 to 323 million tonnes in 2000 and to 470 million tonnes in 2005. The Russian Federation accounts for 12.1 per cent of total world oil production. Over the medium term, production is expected to rise further to approximately 550 million tonnes per year. While much of this production is expected to come from existing fields, new green-field projects are also expected to be developed in the Caspian Sea, East Siberia and Sakhalin.

33. The Russian Federation is the largest producer of natural gas, accounting for about 22 per cent of total world gas production. It is also the country with the largest proven gas reserves, 47 tcm or 27 per cent of the world total. While new incremental gas supplies are likely to come from smaller fields, from more remote and harsher environments and from geologically more complex structures, Russian natural gas production is expected to expand from 598 bcm in 2005 to more than 700 bcm over the next 10 to 15 years. Similarly, exports are projected to rise to Western Europe and to Eastern Europe and could perhaps even begin to Asia in the years to come.

34. Russia supports international cooperation aimed at enhancing global energy security. Political instability and threats of terrorism in selected crude oil and natural gas producing countries could lead to a situation where consumers are prepared to pay a higher price for secure and reliable energy supplies from other regions. For many decades the Russian Federation has been considered a reliable supplier of oil and gas to the European market. In addition to honouring its contractual obligations, Russia has been constantly increasing its reserves base and its production levels as well as extending its transportation network.

35. Large oil and gas reserves and the rapid increase of hydrocarbons production in Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan have made these countries important players in the international energy market. It is estimated that these four countries have 6.5 billion tonnes of proven oil reserves and 19 tcm of gas. In addition, probable oil reserves of the Caspian Sea region are estimated to be 20 – 23 billion tonnes of oil and 8 – 9 tcm of gas. In 2004, exports from the Caspian Sea region accounted for 60 million tonnes of oil and 57 bcm of natural gas. Some experts believe these numbers could double and even triple by the year 2015.

36. The further development of the oil and gas industry in Caspian Sea countries is constrained by two main bottlenecks: an insufficient transportation capacity for increasing export flows and inadequate investment. Most of the existing pipelines and seaports in the region are a legacy of the Soviet Union built long before a significant increase in oil and gas production was anticipated. For example, the oil pipelines from Ätyrau to Samara and from Baku to Novorossiysk can only carry 22 million tonnes of Caspian Sea oil annually. Similarly, the 'Central Asia – Centre' natural gas network can carry only about 45 – 55 bcm of gas.

37. Over the last few years, countries of the region have commissioned a number of new pipelines and upgraded capacity of existing lines including the CPC, BTC, BTE, and the construction of the Kazakhstan-China pipeline. Nevertheless, experts are evaluating the construction of new export lines since this capacity will not be enough to meet the growing production levels in response to the rising demand for hydrocarbons.

38. Enhancing investments in exploration, production and transport of energy resources in the Caspian Sea region is one of the priorities of the Russian Federation. Leading Russian energy and oil companies operate jointly with other national energy companies in oil and gas projects in the Caspian Sea region. These joint ventures include the development of the Karachaganak and Kumkol oil fields in Kazakhstan, the Shah-Deniz gas-condensate field in Azerbaijan, oil and gas fields in Uzbekistan, as well as a range of transportation projects.

39. The Russian oil company Lukoil began exploration of the northern Caspian Sea in 1995 and is working to produce natural gas by 2008. Five large oil and condensate fields have been found in the northern Caspian Sea since Lukoil began exploring including Khvalinskoye, Yuri Korchagin, Rakushechnoye, and Sarmatskoye. One of these, Khvalinskoye, will be exploited by a fifty-fifty joint venture between Lukoil and Kazakhstan. In July 2003, Lukoil and Gazprom established a joint venture with Kazakhstan's state oil company, KazMynaiGaz, to develop the Tsentralnaya hydrocarbon structure, located on the border of the Russian and Kazakhstani offshore sectors. According to Lukoil, the Tsentralnaya structure holds recoverable reserves of roughly 0.6 tcm of natural gas and drilling is expected to begin in 2007. Gazprom is also party to another project in the offshore Caspian Sea called Kurmangazy. The Kurmangazy field, which Kazakhstan estimates to contain around 1 billion tonnes of oil, is also located at the border between Russia and Kazakhstan 's sectors of the Caspian Sea. The field is also being developed in conjunction with Kazakhstan 's natural gas company, Kazmynaigaz. Exploratory drilling at Kurmangazy began during 2003 with a total capital investment of US\$2.1 billion.

40. The Russian Federation expects that efficient and mutually beneficial international cooperation with Caspian countries in the energy sector will not only stimulate development of their economies but also will significantly strengthen global energy security.

Turkey

41. Energy demand in Turkey has been growing at an annual rate of about 6 per cent for decades keeping pace with economic development and rising living standards. At present, domestic resources provide roughly 30 per cent of total energy demand while the rest comes from a diversified range of oil, coal and natural gas imports.

42. Turkey has emerged as an important player in energy diplomacy and supply security, given its geographic location between western energy consuming markets and the large energy producers located in the Middle East and Caspian Sea region. Three fourths of the world's proven oil and gas reserves are located within Turkey's neighbourhood. One of the main elements of Turkey's energy strategy is to establish an energy corridor between the energy-rich countries of the region and the energy consuming markets, the United States and Europe in particular.

43. By providing an outlet as an energy transit country and a reliable distribution hub for hydrocarbon resources in the Caspian Sea region, Turkey helps to:

- strengthen the independence and prosperity of the new Caspian Sea region states by ensuring the free flow of hydrocarbons to world markets;
- encourage market economy and democratic developments;
- stabilise the region by building up economic links among countries;
- diversify and secure energy supply to Turkey and other consumers.

44. Within the concept of an East – West Energy Corridor, Turkey participates actively in the implementation of two major projects that strengthen both regional and global energy security: the BTC oil project and BTE natural gas pipeline project. It has also joined initiatives to establish regional markets, such as the Energy Community of South-East Europe and Med-Ring Project. These initiatives are expected to increase cross-border electricity and gas trade and thus enhance energy security in the region.

45. While Turkey develops projects to meet its domestic demand, it also envisages helping to meet the European Union's increasing energy demand by opening several other arteries to the continent via Turkey. Three major projects are under consideration: the Arab Natural Gas Pipeline, the Turkey-Bulgaria-Romania-Hungary-Austria (NABUCCO) natural gas pipeline and the Turkish-Greek-Italian interconnection. In addition, the anticipated expansion of the BTC to Kazakhstan will consolidate Turkey's role as a hub and a transit country. Some 6 to 7 per cent of global oil supply is expected to transit Turkey by 2012 in view of the capacities of the BTC, the Iraqi – Turkish oil pipeline for Kirkuk to Yumurtalik, the Samsun-Ceyhan by-pass pipeline now under development and the oil transported through the Turkish Straits. Furthermore, Turkey will also become a major transit country and the fourth artery of the EU for natural gas in the years to come considering the extension of the Blue Stream gas pipeline to Ceyhan and thence to Ashkalon with a view to supplying Israel with Russian gas.

46. While the EU is now the world's largest market for natural gas, it is also one of the world's fastest growing energy markets. The EU is naturally seeking to diversify its sources of natural gas supplies although it already has a variety of suppliers – notably the Russian Federation, Norway and Algeria. In this context, natural gas from the Caspian Sea region offers an important prospect for meeting Europe's steadily increasing gas demand provided that secure transportation systems are established. Turkey offers a secure route to Europe for this purpose.