

FUTURE DEVELOPMENTS ON OIL AND GAS TRANSPORT IN THE BLACK SEA REGION

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ABSTRACT

The Black Sea region lies at the crossroads of major oil and gas export flows to the world energy markets. Wider Black Sea area is increasingly becoming very important in terms of energy production, transportation and distribution.

Last global tendencies in energy field indicate that the Black Sea region plays an important role in formation of new energy map of the Eurasian continent, which in perspective will contain such aspects, as diversification of oil and gas supplies, new routes of transportation of energy sources to the European markets and ensuring security of these projects. The concept of wider Black Sea region implies along with Russian oil and gas resources an increasing role of the energy sources of the Caspian basin with participation of Trans-Caspian countries – Iran, Kazakhstan and Turkmenistan in regional energy projects. The Black Sea region is a strategically important region as well as for own fossil reserves.

Keywords: *Black Sea, energy, oil and gas transport, pipelines.*

1. INTRODUCTION

In November 2006 the 2nd Energy Ministerial Conference was held under the Baku Initiative sponsored by the European Commission, and a new Energy Road Map was agreed by the European Commission and Governments of Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkey, Ukraine, Uzbekistan and the Russian Federation (as an observer) setting out a plan of action to bridge the gap between the current situation in the energy sector of these countries and the long-term vision for a common energy strategy.

The priority areas identified in the Road Map include supporting to sustainable energy development - including energy efficiency, renewable energy sources and demand side management - and attracting investment into energy projects of common interest.

The Energy Community Treaty, having as main goal to set up a legal and economic framework in relation to Network Energy, entered into force on 1st July 2006, accepted Georgia as observer in December 2007 and was enlarged with Moldova (full member from 1st May 2010) and Ukraine (full member from 1st February 2011).

The Contracting Parties established to adopt and implement the *acquis communautaire* on energy, environment, competition and renewables. Turkey has confirmed the intention to engage in formal negotiations to join the Energy Community Treaty.



Figure 1 Map of Black Sea Region

2. PIPELINES IN THE REGION

The *Druzhba pipeline* is the world's longest oil pipeline with 4000 km length reaching Ukraine, Hungary, Poland and Germany. Pipeline was built in 1964 and currently has a capacity of 60–62 million tons per year. There are two project proposals with regard to the further extension of the Druzhba pipeline: extension of the northern branch of pipeline to the German North Sea port of Wilhelmshaven and extension of the pipeline to pass through Hungary and Croatia for reaching Adriatic Sea.

The *Baku–Tbilisi–Ceyhan pipeline* is a 1,768 km long crude oil pipeline from the Azeri-Chirag-Guneshli oil field in the Caspian Sea to the Mediterranean Sea. It connects Baku, the capital of Azerbaijan; Tbilisi, the capital of Georgia; and Ceyhan, a port on the south-eastern Mediterranean coast of Turkey, hence its name. It is operational from 10 May 2006 and is projected to transport 1 million barrels per day.

The *Odessa–Brody pipeline* (also known as *Sarmatia pipeline*) is a crude oil pipeline between the Ukrainian cities Odessa at the Black Sea, and Brody near the Ukrainian-Polish border (674 km). There are plans to expand the pipeline to Plock, and furthermore to Gdańsk in Poland.

Blue Stream is a major trans-Black Sea gas pipeline that carries natural gas from Russia into Turkey. Operating at full capacity delivers 16 bcm per year. The pipeline was built with the intent of diversifying Russian gas delivery routes to Turkey and avoiding third countries. It is planned to build the second leg of pipeline to allow expanding Russian gas export to the south (via Samsun-Ceyhan gas pipeline further to Israel and Lebanon).

South Caucasus Gas Pipeline (Baku-Tbilisi-Erzurum route) is to transport natural gas from the Shah Deniz gas field in the Azerbaijan sector of the Caspian Sea to Turkey. First deliveries of gas started in December 2006.

The pipeline is being constructed in the same corridor as the Baku-Tbilisi-Ceyhan oil pipeline in order to minimize the environmental and social impact. The pipeline is 692-km-long and the annual capacity will be up to 16 bcm, with the potential of being connected to Turkmen and Kazakh producers through the planned Trans-Caspian Pipeline.

The first aim of pipeline is to supply Georgia and Turkey. In longer perspective South Caucasus pipeline will supply Europe with Caspian natural gas, including Iran and Turkmenistan, through the planned NABUCCO project, Turkey-Greece and Greece-Italy pipelines.

NABUCCO is a gas pipeline project connecting the Caspian region, Middle East and Egypt via Turkey, Bulgaria, Romania, and Hungary with Austria and further on with the Central and Western European gas markets. The pipeline planned length is 3.900 km and the transport capacity of pipeline will be 31 bcm per year.

Another proposed route aiming at the transportation of natural gas from Kazakhstan and Turkmenistan to Central Europe is expansion of *Central Asian-Centre* gas pipeline, which runs from Turkmenistan via Uzbekistan and Kazakhstan to Russia.

Burgas-Alexandroupoulos oil pipeline (279 km) is a project for transportation of Russian and Caspian oil from the Bulgarian Black Sea port of Burgas to the Greek Aegean port of Alexandroupoli. It would be an alternative route for Russian oil for bypassing the Bosphorus and the Dardanelles.

However, in June 2010 it was announced that Bulgaria will not participate in the project to due strong opposition of local population of Burgas and an environmental impact assessment is needed before making a final decision about the project.



Figure 2 Oil and gas pipelines in the Black Sea Region (Source: <http://maps.grida.no>)

The *Pan-European Oil Pipeline* is a proposed oil pipeline from Constanța in Romania via Serbia and Croatia to Rijeka and from there through Slovenia to Trieste in Italy (1,856 km).

The aim of the pipeline is to bypass Turkish straits in the transportation of Russian and Caspian oil to Central Europe. In Trieste the pipeline will be connected with the Transalpine Pipeline, running to Austria and Germany.

Trans-Caspian Pipeline project is a proposed submarine pipeline between city of Turkmenbashi in Turkmenistan and Baku in Azerbaijan and considered as a part of the South Caucasus pipeline and NABUCCO project.

Along with South Caucasus and Trans-Caucasus pipelines the *Iran-Turkey gas pipeline* with extension of 2.577 km is the third essential branch of the NABUCCO project. The construction of pipeline was completed in

2001. In Erzurum the Iran-Turkey pipeline is linked to the South Caucasus pipeline.

Iran-Armenia gas pipeline is a 140 km pipeline between two countries running from Tabriz to Iran-Armenia border. The initial capacity of the pipeline is 1.1 bcm annually, which will be increased up to 2.3 bcm by 2019.

The Armenian side plans to lay some more 197 km of the pipe in order to reach the planned amount. The pipeline operation started on December 2006 and was officially inaugurated on 19 March 2007.

AMBO (Trans-Balkan pipeline) project is planned oil pipeline from Bulgarian Black Sea port Burgas via Former Yugoslav Republic of Macedonia (FYROM) to Albanian Adriatic port Vlore. The 894-km pipeline is expected to transport 750 000 barrels of oil per day. Trilateral convention on the AMBO project was signed on 31 January 2007.

3. RENEWABLE ENERGY

In the Black Sea Region each country is distinct in terms of its energy use and potential for renewable energy, but several trends are clear.

First is that renewables are clearly underexploited. Second is that of the renewables sources, hydropower is the best known, but at large scale (and hence questionably 'renewable'); the massive growth in wind power seen globally is beginning to make itself known in the region.

The abundance of oil and gas in the Caspian region has left countries there using that resource for domestic use, as in Azerbaijan, while many other countries continue to rely heavily on fossil fuels that have historically been available at cheaper than market prices, complicating the economic argument for alternatives.

The State Agency of Ukraine for Energy Efficiency and Energy Conservation (SAUEEEEC) launched in 2010 a project of which includes the largest European solar power plant (80 MW) in Okhotnykovo, Crimea.

The project aims to produce electric energy from "clean" sources – the sun and the wind – to the amount of 2,000 MW. SAUEEEEC expects the production share of alternative energy to make up 30 percent of Ukrainian energy market by 2015.

Ukraine funds its energy saving projects by the profits the government receives from selling CO₂ quota under the Kyoto protocol. In 2009, having traded its CO₂ emission quota to Japan, Ukraine has received almost USD 400 m.

The amount of solar radiation in Ukraine varies between 800 and 1450 W/m² per year and provides an extensive potential market of solar energy projects. As of 2009, Ukraine is the twelfth largest energy market in the world with an installed capacity of 54 GW. Ukraine exports its excess electricity to Hungary, Moldova, Poland, Romania, Russia, and Slovakia.

5. CONCLUSIONS

Most of the Black Sea, both the shelf and the deeper areas, is believed to be prospective for oil and gas. Indeed, numerous discoveries have been made on the shelf of Ukraine (including the Sea of Azov), Romania, and Bulgaria.

Russia excluded, imports of oil and gas are rapidly rising in volume and value, to the extent that they cause considerable foreign trade deficits in some countries, for example Bulgaria.

Previously inaccessible technology is now increasingly available and – except for the Ukraine – all of the countries have improved the terms of access for investors in the petroleum industry in general, in offshore exploration, and in production business in particular.

Similar opportunities may exist offshore of Georgia, Ukraine, and Bulgaria. Similar to the North Sea of 50 years ago, the Black Sea may be on the verge of becoming a major oil and gas producing area.

The opportunities in the area of Black Sea related to oil and gas transport include:

- *New pipelines*

Construction of export pipelines to deliver hydrocarbons to the European markets will improve the access to Caspian resources.

- *Fossil fuel development*

The latest research leads to extension of efforts in development of potential offshore exploitation in the Turkish area. In the Georgian area it is possible to see future developments also. However, transport of fossil energy will lead to increased shipping capacities in connection with further extend of pipeline networks.

- *Regional development*

The new role of the countries in the region (Bulgaria and Romania) as distributors on transportation routes will give them a chance of regional development including creation of work places, new incomes sources etc.

Unfortunately there are also some risks associated to this development in the Black Sea area:

- *Increased oil transport and Bosphorus Strait constrains*

Future developments of the oil export flows from the Caspian region will increase the tankers passage through straits. Proposed projects, which in perspective will bypass Bosphorus Strait, could eliminate the environmental risks and possibility of physical break of energy supply in the region.

- *Environmental damage associated with new energy transport*

New developments in energy transport in the Black sea Region will lead to various environmental impacts and will increase the pollution risk due to ships accidents.

- *Need for effective communication*

The energy cooperation in the region should assure an effective sharing of information in case of an external energy crisis, as well as for assisting the early response and reactions in case of energy threats.

- *Infrastructure development*

Wider investment policy for the improvement and liberalization of investment opportunities in the energy sector is needed for rehabilitation and modernization of existing energy infrastructure and construction of new energy capacities.

Exports of crude oil from Black Sea ports averaging at over 100 million tonnes a year are expected to continue to rise, resulting in continued seaborne transits via the Bosphorus and increased use of eastern Mediterranean ports linked to new pipelines intended to bypass the Bosphorus.

Novorossiysk is the main export port in the Black Sea, accounting for 70% of oil loaded at Black Sea ports.

The European Commission has started streamlining the various transport cooperation efforts. It has launched exploratory talks with the countries of the region on extension of the trans-European transport networks.

7. REFERENCES

- [1] Report on the first year of implementation of the Black Sea Synergy, Commission of the European Communities, Communication from the Commission to the Council and the European Parliament, Brussels, 19.6.2008, COM(2008) 391
- [2] Worldwide News Ukraine, www.inogate.org
- [3] Wind in Power – 2010 European statistics, The European Wind energy Association, February 2011
- [4] The Wider Black Sea Region in the 21st Century, Strategic, Economic and Energy Perspectives, Hamilton D., Mangott G. (eds.), Center for Transatlantic Relations, 2008
- [5] The priorities of cooperation between BSEC member states in the field of energy: oil and gas sector, Report adopted by The Thirtieth Plenary session of the PABSEC General Assembly, 20th November 2007
- [6] ‘Diagnostic Report’ to guide improvements to the regular reporting process on the state of the Black Sea environment, Commission on the Protection of Black Sea Against Pollution, 3rd August 2010