



SHALE GAS EXTRACTION IN KAZAKHSTAN: ENVIRONMENTAL CONCERNS

Nowadays, the world energy has entered a new phase of technological development. Combining horizontal drilling with multistage hydraulic fracturing and proppant injection made it possible to start the commercial production of such unconventional sources of hydrocarbons as shale gas. Inspired by the case of the US, the countries with large volume of natural gas consumption has begun to search for shale gas deposits in their territories.

In 2014 the high-level officials of Kazakhstan announced that in the nearest future the country has been planning to conduct geological explorations in search for shale gas. It was stated that developing shale gas deposits would allow Kazakhstan to enter the list of top 10 world energy producer countries. However, some local environmental science experts stress that commercial production of the unconventional shale and the methane-coal gas in Kazakhstan would cause substantial damage to the country's ecosystem.

It should be noted that production of gas from shale deposits has a number of specific features. Due to the high density and strength of the gas-bearing shale the only technology, which allows to liberate gas from reservoir, is the hydraulic fracturing. Since shale has relatively low permeability, a well has to be fractured repeatedly. Thus, the extraction of shale gas seriously affects the subsoil and the surrounding ecosystem.

Nowadays, one of the most serious environmental problems for Kazakhstan is land degradation and depletion of landscape. At present, over 76% of the territory of Kazakhstan is under desertification process. A strong degree of desertification is observed in the areas where the mineral resources have been actively developed. At the same time, the world practice shows that shale gas drilling and production requires a great amount of specific equipment and a

necessary infrastructure – vehicles, frac tanks (water storages), chemicals, proppant and others. The usage of these facilities have been causing damage to the environment because of the leakage of chemicals, corrosive compounds, fracturing liquid flowback. Therefore, the inevitable pollution occurring during the fracturing has been leading to an increase in the number of marginalized areas, which are not suitable for agriculture.

Another point, which should be taken into consideration, is water scarcity. In terms of water availability, Kazakhstan is one of the most water-scarce countries of the Eurasian continent and ranks last among the CIS countries. There is an acute shortage of water resources for the needs of both industry and agriculture, so as for domestic water supply. However, the shale gas production technology needs free access to virtually unlimited volumes of water.

On average, it can take up to 15 million liters of water to fracture a single well. Besides that, the shale gas production causes the contamination of surface and groundwater with different toxic gases (methane, ethane, propane, etc.) and the chemicals contained in the fluid flowbacks.

Ecologists also express concern over the unfavorable radiation situation in the country. Due to the vigorous activity of the aerospace industry (Baikonur Cosmodrome), more than 400 surface and underground nuclear/thermonuclear explosions at the Semipalatinsk Test Site, so as intensive mining of uranium (1st place in the world) the general situation with radiation and radioecological safety in Kazakhstan reached the critical point. The shale gas production is always accompanied by removing of the natural radioactive radionuclides and their cleavage products during well drilling. For instance, the radon gas may migrate completely to surface and can penetrate into the houses and office buildings, so it can easily

become a source of radiation for employees and population.

Nowadays, Kazakhstan occupies 23rd place in the list of world countries with the highest amount of greenhouse gas emissions, also it takes 3rd place among the CIS countries (after Russia and Ukraine) and 1st place among the countries of Central Asia. Considering that the extraction of shale gas leads to losses of methane and other gases, which together cause the global warming, it becomes clear that if Kazakhstan starts large-scale production of shale gas, it will have a negative impact on greenhouse gas emissions over the country.

Therefore, international experience shows that unconventional gas production (gas-bearing shale and coal seams) impose a significant impact on the environment, namely, on geological structures, underground and surface water, air, soil and land.

It should be noted that the environmental risks associated with the development of shale gas deposits cause both pollution and degradation of the natural environment, so as the large-scale consumption of water which is the most precious natural resource. After utilization of the fracturing technologies, there would be need for large amounts of spending on restoration of damaged ecosystems, on providing medical assistance to the population and on possible resettlement of people from the areas of environmental degradation. On the other hand, technology is not standing still. In this regard, the further development of shale gas extraction industry on a global scale will be dependent on the successfulness of resolving environmental and social risks associated with the shale hydrocarbons production. That is why, firstly, Kazakhstan could clarify its energy strategy related to the large-scale production of shale gas and tight oil in general, and to the introduction of fracturing technologies in particular.

Politics, Foreign Affairs and Security

- The President of Ukraine Petro Poroshenko appealed to the country's Constitutional Court, asking to recognize the ousting of former President Viktor Yanukovich in February 2014 as illegitimate.
- The European Council (EC) has officially extended sanctions against the Crimean Peninsula and the city of Sevastopol until June 23, 2016. Also the EC made a decision to extend sanctions against Russia for six months until January 31, 2016.
- The Parliament of Iran approved generalities of a disputed bill about the country's nuclear issue. The bill passed by 199 positive vote would oblige the Iranian government to preserve the country's nuclear achievements and rights.
- During the opening ceremony of the International Military Forum, Army-2015 Expo, the President of Russia Vladimir Putin announced that the country would add more than 40 new intercontinental ballistic missiles to nuclear arsenal in 2015. This statement drew criticisms from NATO members, especially, the US, which would install the Aegis Ashore Ballistic Missile Defense system in Romania, completing Phase 2 of the European Phased Adaptive Approach by the end of 2015.
- The first round of indirect reconciliation talks between the Yemeni government and Houthi rebels in Geneva ended without bringing any positive results.

Economy, Finance and Energy

- The Minister of Energy of Russia Alexander Novak and his Greek counterpart Panagiotis Lafazanis on the sidelines of the St. Petersburg International Economic Forum signed an intergovernmental cooperation memorandum on construction of continuation of the Turkish Stream natural gas pipeline on the territory of Greece. The construction of Greece's continuation of the pipeline would start in 2016 and finish in 2019.

- The Head of the Ministry of Foreign Economic Relations, Investments and Trade of Uzbekistan Elyor Ganiev and Chinese Deputy Minister of Commerce Zhong Shan signed a Protocol on the expansion of trade and economic cooperation within the framework of the creation of "Silk Road Economic Belt". The protocol was inked during the Third Meeting of the China-Uzbekistan Intergovernmental Cooperation Committee in Shandong Province.
- China's Huarong Energy Company Limited announced that drilling work of 36 new wells in the company's Kyrgyzstan Project had been completed and a daily production of approximately 737 barrels of oil was recorded.
- During the VI. International Mining and Metallurgical Congress «Astana Mining & Metallurgy», Kazakhstan's Deputy Prime Minister Bakhytzhon Sagintayev announced that Kazakhstan would increase domestic titanium share up to 20% in the world segment. Planned increase would be made as part of the National Plan "100 concrete steps on implementation of 5 institutional reforms".
- The European Commission disbursed €10 million in grants to Kyrgyzstan as part of the EU Macro-Financial Assistance (MFA) for the country. This amount was the part of the first tranche of the €30 million MFA program, which the EU approved in October 2013.
- The Deputy Director of the Coal Industry Department of the Ministry of Energy of Kazakhstan Sovet Dambarbayev stated that the country would produce more than 108.6 million tons of coal in 2015 with the export capacity of more than 30 million tons. In 2014, Kazakhstan produced 107.6 million tons, which fully met the domestic need for coal.
- The Ministry of Oil and Mineral Resources of Turkmenistan announced that the country developed a feasibility study for new refinery construction in the village of

Ekerem of Balkan province. The new plant would meet international standards in the field of environmental protection and ecological safety.

- The Cabinet of Ministers of Uzbekistan affirmed by decree the purchasing prices for grain of the cereals of 2015 yield, supplied for the state needs. In accordance with the decree, the purchasing price of one metric ton of durum wheat of the first and third classes in Uzbekistan has increased by 10.1%, and the purchasing price of durum wheat of the fourth grade increased by 21.1%.

Society and Culture

- Former Turkish President Süleyman Demirel, who held office from 1993-2000 has died, aged 91. In a career that stretched over nearly half a century he also served as the country's Prime Minister seven times.
- A new central repository for radioactive waste has opened in the Chernobyl exclusion zone in Ukraine. The facility has been funded by the UK and the EU at a cost of some €17.5 million. The center would house thousands of sources of radiation waste, by-products of construction, engineering and many other industries for up to 50 years.
- The Ministry of Defense of Russia announced that it would construct more than ten complexes of new-generation space surveillance systems, increasing the precision of space observation. The construction of the new space surveillance systems would take place in Moscow, Kaliningrad, Altai and Primorsky regions.
- Over 5,000 demonstrators gathered in Yerevan to rally against the Armenian's government's decision to raise electricity prices for households by 17-22%.
- Muslims around the world started celebrating the holy month of Ramadan. The Islamic holy month of Ramadan began on June 18, 2015 and would last 29 days.