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Challenges of Shale Gas Production

For any country the problem of energetic independence is very important. In Ukraine there is a large oil and gas area with plenty of productive horizons located in the Dnieper-Donets Basin. The occurrence of shale gas in the basin is closely associated with clastic sedimentary rocks of the Middle and Upper Carboniferous and Lower Permian. It is considered that on alleged volume of shale gas deposits (22 trillion cubic meters), our country is quite able to provide itself with this source of energy. Moreover, the first results of exploration done by the Shell company, have shown that Ukrainian field can be developed.

To release gas from the pores hydraulic fracturing is done. Further, in horizontal section (lateral wall) explosives are pumped, cement seal is put, and blast is produced. For gas to go through too small cracks, fracking is used. Huge amount of clean water to 12,000 cubic meters is taken, and with lethal chemicals (more than 580 kinds) is converted into a gel-like mass, mixed with coarse quartz sand and under great pressure (up to 1500 atm) is pumped into the ground. As a result, cracks are widened, and gas is released, but there remained sand and toxic gel that are saturated at the depth with radioactive elements classified as “liquid radioactive effluents of 1-3 danger level”. Dissolved acid is poured into the pit from where it seeps into the ground water, getting into wells, rivers, reservoirs. To select gas from well, fracturing is performed 5-8 times. Then tower is transferred to a new location.

And everything starts again.

As a result of this process, the groundwater and surface water of the basins of the Seversky Donets River, the sea of Azov are poisoned resulting in extinction of millions of people-the inhabitants of Donetsk, Kharkiv, Luhansk regions.

Currently, our country is not ready for large-scale production of shale gas; the development of research in this area is urged with minimizing the harm done to our environment.