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## **Perspectives of Shale Gases Extraction in Ukraine**

World reserves of shale gas are 200 trillion m<sup>3</sup>. According to *HIS CERA*, shale gas extraction can reach 180 milliard m<sup>3</sup> a year by 2018. In 2010 Ukraine gave a licence for shale gas exploration for *Exxon Mobil* and *Shell* companies. In October, 2012, *Shell* began drilling of the first exploratory gas well in consolidated sandstones in Kharkiv region. It is expected that shale gas commercial production will begin in the years of 2018-2019 in Donetsk, Lviv, and Kharkiv region.

Shale gas is the natural gas consisting mostly of methane. Shale gas extraction requires using horizontal drilling and hydrofracturing. Such method means high density of gas wells. Moreover, this method need huge water reserves as one hydrofracturing requires 5000 – 20000 tons of the mixture of water, sand, and chemicals while just one well can have dozens of hydrofracturings.

Shale gas usually occurs in shale rocks at depth of 1.5 – 2.5 km; it is extracted by means of horizontal wells being parallel to water-bearing levels. Gas of consolidated sandstones occurs at depth of more than 5 km to be extracted by means of vertical wells. As a rule drinking water levels are at depth of about 500 m. Great amount of waste water with chemical substances accumulates within the deposit area. After soil contact, this water contaminates it destroying its fertility and polluting underground water. Moreover, fissures as a result of hydrofracturing can expand upwards resulting in methane entering into them.

Shale gas extraction results in inconsiderable contamination of underground waters with toluene, solene, benzol, dimethylbenzene, ethylbenzene, arsenic, and other harmful substances as one hydrofracturing operation requires using 80-300 tons of chemicals of up to 500 items. While applying this technology there are much more carbon dioxide emissions comparing to extraction of other fossil fuels. However, mining companies insist that hydrofracturing is safe if all the technologies are followed.

There are also definite advantages of shale gas extraction. First, it is the possibility to reduce dependence on our largest gas supplier (Russia). Moreover, successful development of shale gas extraction will create more jobs.

It should be noted that wide-range operations for shale gas extraction requires considerable investments that is why there should be serious research and experimental works to have real estimation of shale gas reserves, possibilities of their large-scale extraction in different areas. It is also necessary to study problem of selection of the appropriate technology of shale gas extraction with its preliminary evaluation as for its economic efficiency.