



## Environmental and Health risks of Shale Gas exploitation in Europe



**Context** - As opportunities for exploitation of conventional resources of natural gas are becoming more limited, new sources of gas are being increasingly being mobilized in order to meet the demand. One such important source is shale gas, which needs for extraction a process called «hydraulic fracturing», through which a pressurized liquid is injected in the rockbed in order to create fissures and release the gas.

What are the potential health and environmental risks of hydraulic fracturing ?

### → WHY ARE UNCONVENTIONAL NATURAL GAS RESOURCES IN EUROPE LIKELY TO BE EXPLOITED?

Exploration and production of natural gas and oil within Europe has in the past been mainly focused on resources that can be exploited through conventional boreholes. These resources are getting more and more limited in the EU, and in order to meet demand, new sources are being developed.

EU countries are now turning to exploring unconventional natural gas resources, such as coalbed methane and shale gas. In order to exploit these resources, the rock layers need to be altered before the oil and gas can flow.

One of the techniques that can be used to alter the rocks is hydraulic fracturing, where pressurized liquid is injected into the rocks in order to create fissures and release the gas and oil.

This technique hasn't yet been used on a large scale in Europe, but with a growing interest by many European countries to develop shale gas extraction, the European Commission has requested this assessment on the health and environmental risks that could be associated with larger-scale use of hydraulic fracturing.

### → WHAT POTENTIAL RISKS WERE IDENTIFIED?

The potential sources of environmental and health risks that are associated with hydraulic fracturing operations:

- The use of significant volumes of water and chemicals and the lower yield of unconventional gas wells compared to conventional gas extraction;
- Ensuring the integrity of wells and other equipment throughout and after the lifetime of the plant;
- The potential toxicity of chemical additives and the challenge to develop greener alternatives; ensuring that spillages of chemicals and waste waters with potential environmental consequences are avoided ;
- Ensuring a correct identification and selection of geological sites;
- The uncertainties associated with the long-term presence of hydraulic fracturing fluid in the underground;
- The unavoidable traffic impacts;
- The potential for development over a wider

area than is typical of conventional gas fields;

- The emissions to the atmosphere and noise impacts related to plant and equipment during well construction and use.

The report identified a high risk for most of the environmental aspects examined in the case of the cumulative impact of the installation and exploitation of multiple wells. These include risks of water contamination as well as release of contaminants into the air and into the ground, and direct risks to biodiversity.

### → WHAT IS RECOMMENDED TO MANAGE THOSE RISKS?

Some measures can be taken to manage and reduce these risks:

- The development of less environmentally hazardous drilling and fracturing fluids;
- Development of better casing and cementing methods and practices in order to increase well integrity;
- Development of a searchable European database of hydraulic fracturing fluid composition;
- Research into the risks and causes of methane migration to groundwater from shale gas extraction;
- Development of a system of voluntary ecological initiatives within sensitive habitats to mitigate future exploitation.

The EU legislation also needs to be adjusted in order to sufficiently address the risks and uncertainties associated with high volume hydraulic fracturing (HVHF) projects.

**These are highlights of the report:** "Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe. Report for the European Commission." A report commissioned by DG Environment and produced by AEA Technology.

The content of this short 'highlight' summary has been reviewed by AEA to ensure that it represents faithfully the content of the original report.

You can find more information on this topic on the GreenFacts website: [www.greenfacts.org/en/shale-gas/](http://www.greenfacts.org/en/shale-gas/)