

## No Export of Risks!

**An Appeal for a Differentiated Discussion of Fracking in Germany  
By Professor Dr. Frank Schilling**



*Opponents of fracking fear that the chemicals used for drilling will contaminate the environment.*  
(Photo: iStockphoto)

Cars, electricity from the socket, genetic engineering or fracking: Any technology is associated with opportunities and risks. Many technologies are used by us as a matter of course. We do not want to do without the advantages resulting for our speed, comfort or health. Some technologies, however, are discussed extremely critically and their use is highly difficult in Germany at least. An example is "hydraulic fracturing". A public, also controversial, discussion of this topic is needed, but it should be based mainly on facts rather than on emotions. Although it is a technology with various applications, I will refer to the extraction of shale gas by fracking exclusively.

How does this hydraulic fracking work? First, companies drill boreholes. Depending on the geology, vertical boreholes are drilled down to a depth of about 1500 m. Then, they proceed in horizontal direction through the geological target formation for about the same length. There, the rocks are broken up with water under high pressure in pre-defined areas (hydraulic fracturing). Sand grains in the water are introduced into the cracks formed in order to keep them open. Up to 2% of mainly organic substances are added to the water-sand mixture to increase the viscosity, similar to a thin pudding. In this way, the sand can be transported horizon-

tally and into the cracks. Without these additives, it would deposit at a deep point and clog the borehole.

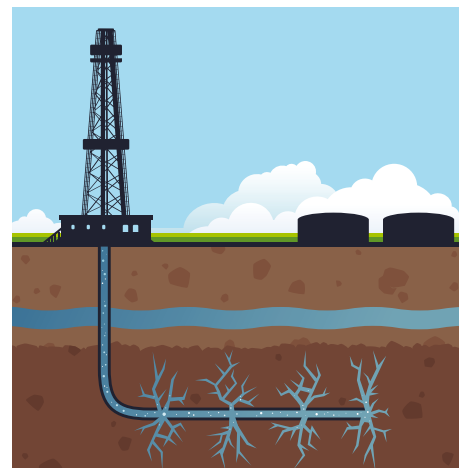
The process described above in a rather simplified manner gives rise to various concerns in public discussion. Let us first concentrate on the potential hazards for the environment and health. At every drilling site in Germany, ground sealing and oil separators are required to prevent chemicals from being released into the environment in an uncontrolled manner. Still, the risk remains that some substances may enter the ground when they are decanted. When drilling boreholes, observation of water protection areas therefore is as important as when building petrol stations. The borehole is lined with concrete and steel in order to protect the groundwater aquifers. After extraction, the hole has to be closed with seals of concrete and clays that are several meters long. This prevents the fracking fluids from entering the groundwater.

How dangerous are the chemicals? Apart from water and sand which are both non-toxic, organic compounds are used, with and without biocides. The same biocides are used in skin creams and paints, with their concentrations exceeding that of the fracking fluid by far. From creams or paints,

biocides easily enter the environment. During fracking, they remain deep down in the bedrock. Fracking fluids of high density do not rise automatically to the top, even less through concrete and clay seals. Moreover, the mixtures have been improved to such an extent that fracking now can be accomplished without biocides. The fluid is easy to decompose biologically.

And what about the damage of buildings due to tremors? This might be possible, in my opinion, but heavy duty road traffic and road construction cause much stronger vibrations than expert drilling of fracking boreholes. Moreover, operation companies are obliged to compensate damage, if cracks develop in walls or roads, as are road construction companies. I consider it to be nearly impossible that expert fracking causes structural damage of buildings.

My conclusion: Germany imports energy. At the same time, we export our "consumption of the environment", examples being the Niger delta, leaking pipelines in the Russian tundra, or oil production in the Gulf of Mexico. Shouldn't we extract gas in Germany according to our local standards with a far smaller environmental risk, and with high safety standards being required and observed? I am in favor of seriously examining fracking in potentially suitable geological formations in Germany as one element of a transformed energy system and secure energy supply.



*Using a water-sand mixture, the rock is broken up under high pressure.* (Photo: iStockphoto)