

The underlying source of shale gas controversies

# Tapping Deep into Public Emotions



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**On the one hand, shale gas extraction has been portrayed as the future of Poland's energy sector, and on the other, as an undertaking potentially harmful to the natural environment that might spark public protests. Why are opinions on this issue so widely disparate?**

Shale gas is found in deposits of shale, which are dark clayey rocks characterized by a tendency to split into thin sheets, a property known as fissility. Despite being listed as one of the "unconventional" sources of gas, shale gas has the same origin as other types of natural gas: it was formed from organic matter that was deposited in life-rich seas and underwent long and complex transformations. Gas formed within the source rock usually migrates to porous reservoir rocks and traps, thus forming what are called

conventional gas reservoirs. Gas that remains trapped inside the source rock itself is referred to as shale gas. Conventional gas production is a well-known process. In unconventional reservoirs, however, gas is dispersed and trapped in small pore spaces. Here production techniques are still being developed.

## So much controversy

Exploring for and producing natural gas from shales involves drilling wells into the earth, a process that usually takes several months. Satisfactory results often require directional drilling (horizontal boreholes), with multiple horizontal wells being drilled from a single drill site, or pad. The exact number of wells depends on the structure of the reservoir and its depth. For example, an average pad for drilling a single well covers 1.5 ha, while that for seven wells is 3.5 ha (in pad drilling). This means that it is possible to extract gas from an area up to 500 times the size of the drill site itself. Releasing gas from the rock requires reservoir stimulation to induce a network of fractures and enable the flow of gas to the surface through the borehole. Hydraulic fracturing, a common method of gas reservoir stimulation, involves the use of fluids whose composition depends on the mineral composition of the shale rocks and their physical properties. Water and proppants (sand or ceramic) account for more than 99.5% of the fracturing fluid, with the remaining 0.5 percent being comprised of chemical additives that reduce friction and the viscosity of the fluid, prevent clays from swelling, hinder the growth of bacteria, prevent the corrosion of pipes, and help carry the proppants.

Fracturing fluid must be injected deep into the well as fast as possible and at high pressure, up to 1,000 bars. A single fracturing operation typically takes several hours, with a series of such operations (from several up to a dozen or so) being usually performed in a vertical or horizontal well.



Dariusz Iwański („Pracownia Iwański” Studio)/from PIC-PIB collections

**At present, Poland produces gas from nearly 200 conventional gas reservoirs and from no unconventional reservoirs**

Following hydraulic fracturing, a portion of the fluid returns to the surface (flowback) and is recovered, while the gas released from the rocks flows into the borehole. Just like every type of mining activity, shale gas exploration and production operations are not without influence on the natural environment. Ground and surface waters, soil and ground, the atmosphere and the landscape are all among the elements that are potentially under threat.

A well may remain productive for many years, sometimes up to several decades.

Just like every type of mining activity, shale gas exploration and production operations have an effect on the natural environment. Ground and surface waters, soil and ground, the atmosphere and the landscape are all among the elements that are potentially at risk. In addition, well drilling operations involve increased noise and a heavier truck traffic. However, most of these effects are temporary and mitigable: for example, rigs are typically disassembled after several weeks, or several months at the latest, and a proper well design effectively prevents groundwater contamination (casing strings cemented along the entire length of wells are used to isolate aquifers while drilling). In addition, it should be recognized that the drilling of deep wells, whether for exploration or production, is

nothing new in Poland. So far, over 7,000 wells have been drilled out, but they have caused no surge in public interest, protests, or controversies.

Even so, both ongoing and future shale gas production projects are often portrayed as highly controversial undertakings that spark local protests, nationwide campaigns of environmental organizations, and even measures aimed at blocking the sector's development on the level of EU institutions.

### **We would like to...**

To understand the reasons behind the conflicts surrounding shale gas, we should take a closer look at their scale and dynamics.

Nationwide public opinion surveys taken in 2011-2014 (see p. 14) found 70-80% of the Poles supportive of shale gas extraction. Consequently, it is difficult to talk about any significant conflict of opinions.

Decisions about where to locate touchy infrastructure investments (which shale gas projects undoubtedly are) are usually discussed in terms of something called the NIMBY (“Not In My Backyard”) syndrome. General approval for an investment project typically turns into opposition, once the site turns out to be close to a respondent's own place of residence. Such sentiments are evident also in the case of shale gas projects, but they remain at low levels:

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support falls to “only” 56-66%, while opposition rises to 26-27%.

Therefore, it appears that it is difficult to find any evidence of major conflict surrounding shale gas in nationwide public opinion surveys. This may be because such issues have a direct impact only on selected regions of Poland. But a survey commissioned by the Environment Ministry and taken by TNS Polska in 2013 shows that support for extraction of gas from shale deposits stands at 72%, also in regions where shale gas exploration licenses have been granted (and 58% for locations close to the respondent’s place of residence).

An analysis of media discourse shows that the worst fears are reportedly caused by shale gas exploration and production’s safety for the natural environment, with the primary risks being ground and surface water contamination caused by hydraulic fracturing. And yet if we examine public opinion surveys, it turns out that 51% of the Poles consider shale gas extraction to be environmentally safe, compared with only 17% who believe otherwise (Hipsz, 2013).

Consequently, the question arises: Do the Polish press articles discussing threats re-

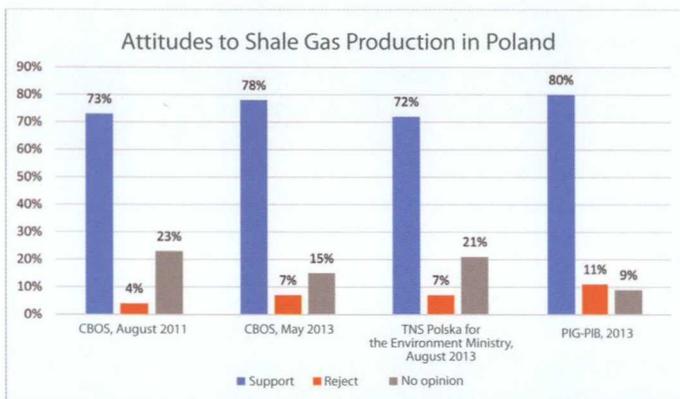
lated to shale gas projects actually reflect the fears of the Polish public? Apparently, they do not. Instead, the media appear to be picking up on, and hyping up, fears expressed by environmental groups both in Poland (such as the Center for Sustainable Development in Łódź, the Civil Affairs Institute INSPRO, and the website Zlupieni.pl) and abroad that actively support the Polish anti-shale movement. From the outset, these groups have centered their message around threats related to water and fracturing.

### ...but are afraid to

Although it is difficult to say that the whole of Polish society is divided on the issue of shale gas, certain conflicts do exist locally. Since mid-2013, there has been much media coverage about protests by inhabitants of the village of Żurawłów in the Lubelszczyzna region that blocked a Chevron drilling site there, preventing exploration work for more than one year. In the Pomerania region, exploration for shale gas has sparked protests since the first seismic tests in 2011, as shown by the “map of opposition” from the citizen journalism portal “Głos Gryfa” (see opposite).

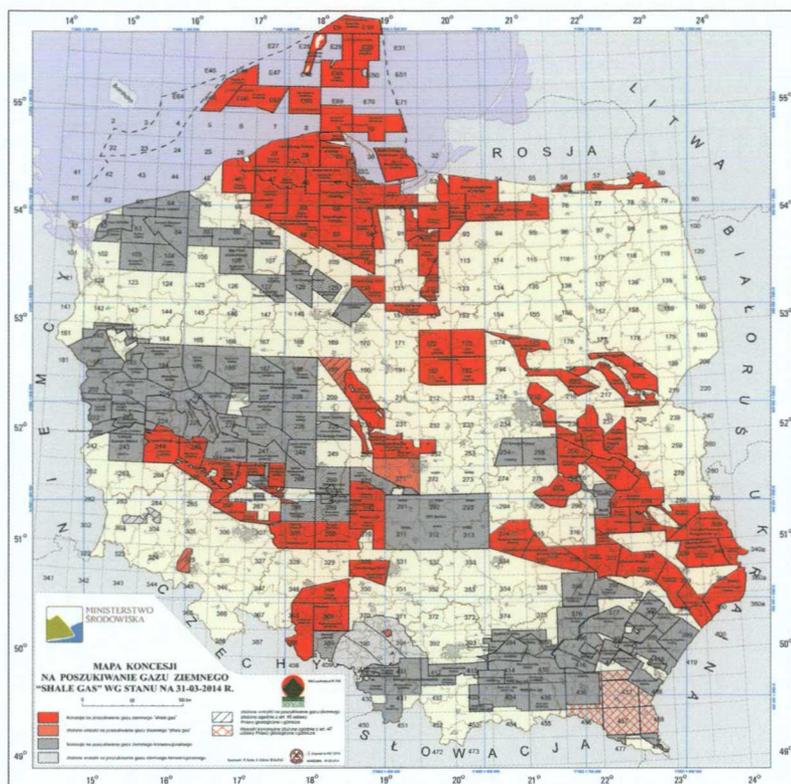
First-hand observations of the dynamics of local protests against shale gas indicate that safety fears related to exploration for shale gas and its production using hydraulic fracturing are the most frequently cited arguments in the protests, yet are not the immediate causes actually triggering those protests. Problems include the absence of relevant information campaigns on the part of investors and their unwillingness to engage in dialogue with local communities and local governments, which prevents investors from gaining insight into their fears and expectations. Inhabitants of the areas where shale gas is to be produced also feel they do not know enough about the powers vested in local and supervision institutions, which is alarming, especially in the face of unclear and constantly changing legal regulations.

Such vocalizations of environmental fears, taken up from environmental organizations and the media, therefore mask a sense of helplessness, of being manhandled by “foreign” corporations, of mistrust in the authorities and investors, of suspicion and a fear of being exploited. At meetings, local residents often ask about safety measures in case of an



Millward Brown SMG/KRC for PIG-PIB, December 2013





Map of Shale Gas Exploration Concessions as of 31 March 2014

Exploration for shale gas in Poland is concentrated in the belt stretching from Pomerania Region and the adjacent Baltic area, through Mazowsze and Podlasie, all the way to the Lubelszczyzna region. This is an area where shale rocks from the Lower Paleozoic (the Ordovician and Silurian periods) were formed. Resources presumed to be economically harnessable were estimated at 0.35-0.77 trillion cubic meters (PIG-PIB Report, 2012). Reports of other organizations, including the EIA/ARI Report from 2012 and 2013, cite different estimates, sometimes even an order of magnitude higher than the PIG-PIB's estimates. Such differences result from different methods of calculation and the adoption of a different – usually larger – perspective area. The next stage of the analysis, aimed at estimating economic reserves in place, will be to collect the results of production tests from at least 100 wells. So far, a total of 60 shale gas identification wells have been drilled (46 vertical and 14 horizontal ones) under 84 licenses for hydrocarbon exploration and identification (including 10 sea licenses), covering nearly 29% of Poland's area. Seventeen hydraulic fracturing operations were performed in vertical wells and eight in directional wells (drilling as at 31 March 2014).

accident (“Who will pay damages?”) as well as monitoring of exploration and production activities (“Who will be watching over that?”) and want to know who makes decisions and issues drilling permits. Consequently, the factors that underlie shale gas conflicts are not so much environmental concerns as the absence of adequate social capital and proper relations between investors on the one hand and local communities and their representatives in local governments on the other.

### The power of dialogue

If we assume that the conflicts are caused not by efforts to harness shale gas as such, but rather by how those efforts are organized, we can spot certain areas of Polish public discourse related to shale gas that have been neglected. Instead of focusing on solely environmental issues, which are being championed by international environmental protection organizations, it is worth paying more attention to the dialogue with local communities conducted by relevant public

institutions: local governments, mining authorities, environmental services, and so on. Such activity should be aimed at creating permanent channels for communication and for exchanging information and opinions between local communities, investors, and the public authorities, as well as at clarifying fears and controversies. This will help not only to avoid conflicts but also to make better decisions, taking the opinions of various social groups into account. ■

#### Further reading:

- Hipsz N. (2013). *Spoleczny stosunek do gazu łupkowego* [The public stance on shale gas] BS/76/2013, Warsaw: Fundacja CBOS.
- PIG-PIB (2013). *Państwowa Służba Geologiczna o gazie w łupkach*. [State Geological Service on shale gas]. ISBN 978-83-7863-266-5
- PIG-PIB (2012). *Ocena zasobów wydobywanych gazu ziemnego i ropy naftowej w formacjach łupkowych dolnego paleozoiku w Polsce (basen bałtycko-podlasko-lubelski)* [Evaluating harnessable shale gas and oil resources in Polish shale formations of the lower Paleozoic] – report, Warsaw.