



Framing Shale Gas for Policy-Making in Poland

Aleksandra Lis & Piotr Stankiewicz

To cite this article: Aleksandra Lis & Piotr Stankiewicz (2016): Framing Shale Gas for Policy-Making in Poland, Journal of Environmental Policy & Planning, DOI: 10.1080/1523908X.2016.1143355

To link to this article: <http://dx.doi.org/10.1080/1523908X.2016.1143355>



Published online: 25 Feb 2016.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Framing Shale Gas for Policy-Making in Poland

ALEKSANDRA LIS* & PIOTR STANKIEWICZ**

**Institute of Ethnology and Cultural Anthropology, Adam Mickiewicz University in Poznan, Poznań, Poland*

***Institute for Sociology, Nicholas Copernicus University in Torun, Toruń, Poland*

ABSTRACT *Despite enthusiasm about new gas reserves, shale gas has not come to Poland without controversies. This study examines how shale gas has been framed as a public issue by political and business elites, experts, local communities and civil society organizations. Through a frame analysis, we found three main frames about shale gas: shale gas as a novel economic resource, as a strategic resource for energy security and as a threat. However, only the first two frames, proposed by political and business elites, have shaped the policy process. The third frame, constructed by local actors and civil society groups, has had minimal impact. We explain this exclusion drawing on the deficit model of risk communication. This approach reveals that Polish experts, and business and political actors, during their interactions with local groups, have framed proponents of the threat frame as 'incompetent actors' effectively excluding the threat frame from policy processes.*

KEY WORDS: shale gas, controversies, policy process, frame analysis, risk communication

Introduction

Although shale gas exploration has only recently started in Europe, it has already evoked contradictory reactions. While opponents perceive shale gas exploitation as risky due to the deployed technology—hydraulic fracturing, some governments and businesses expect a shale gas 'Eldorado' in Europe comparable to that in the US. This optimism is mainly expressed in Poland—the country that according to the American Energy Information Agency (Energy Information Administration [EIA], 2011) may have the biggest shale gas reserves in Europe. Poland is most advanced among European countries in searching for shale gas, with 67 exploration drills completed by the end of October 2014. This article examines how the shale gas issue is framed by various actors in Poland and which frames become formative for policies regulating shale gas exploitation. We propose a framework drawing on frame analysis and the deficit and the participatory models of science communication developed in the Public Understanding of

Correspondence Address: Aleksandra Lis, Institute of Ethnology and Cultural Anthropology, Adam Mickiewicz University in Poznan, ul. Umultowska 89 D, 61-614 Poznań, Poland; Email: alis@amu.edu.pl

Science (PUS) to explain why some frames align while others do not, and why, despite the existence of diverse frames, only particular ones shape policy-making processes.

We reconstructed three frames related to the shale gas issue. The two dominant ones—shale gas as an economic resource or as a source of energy security—were built in policy, business and science circles and present shale gas either as a matter of creating a new commodity for the national and international markets, or of securing a strategic resource for the national security of energy supplies. The third ‘threat frame’ was proposed in localized discourses of communities and civil society organizations and sees shale gas exploration as a matter of using a risky technology—hydraulic fracturing (fracking). We argue that the deficit model of risk communication prevails in Poland and was enacted by actors on all sides of the controversy. Adherence to this model made it difficult to align frames represented by experts, companies and policy-makers and those represented by communities and non-governmental organizations (NGOs).

After a brief introduction to shale gas exploration in Poland, we present our theoretical framework. We then examine how governmental actors framed shale gas and how responses to companies’ behaviour resulted in frame alignment, de-alignment and re-alignment. The fourth section examines how local actors and civil society organizations framed shale gas exploration by emphasizing the risks of fracking. Finally, we show how experts presented counter-frames to the local threat frames and exclude threats from the debate by effectively framing local and civil society actors as incompetent in debating complex technical issues.

Shale Gas Exploration in Poland

Licenses for shale gas exploration in Poland have been issued since 2007. Since 2010 the number of licenses doubled from 51 to 113, and dropped to 60 in October 2014. The Ministry of Environment grants licenses, while the Ministry of Economy and the Ministry of Treasury have certain responsibilities regarding the hydrocarbons sector in Poland. More than 23 companies have obtained permits, including national, partially state-owned and international players. Most licenses belong to Polish state-owned companies PGNiG S.A. (fifteen), Orlen Upstream Sp. z o.o. (9) and Lotos Petrobaltic S.A. (8). Foreign companies, including some global giants, own between one and five licenses each: Chevron (four) and MarathonOil (four), Total (one) and ExxonMobil (one).

Permits have been issued for five years, some of which have already expired. Some license holders chose not to apply for an extension, a likely result of unfavourable geological conditions in some areas and poor financial standing of some companies (Sawicki, 2014). Commercial exploitation has not started yet as no economically viable sources of shale gas have been identified.

Poland is expected to have the largest shale gas deposits in Europe, although estimates vary significantly. The American Energy Information Agency estimated shale gas reserves in Poland to be 5.3 billion cubic metres (EIA, 2011). The initial enthusiasm was dampened one year later by the Polish Geological Institute’s estimates of 346–768 billion cubic metres (Rutkowski, 2013). Other reports, published by Rynstad Energy, Wood MacKenzie or Advance Research Institute, calculated deposits to be at around 1–3 billion cubic metres (Olkuski, 2013). However, prior to the completion of exploration activities it is difficult to assess commercially available shale gas (Rutkowski, 2013).

Polish shale gas deposits stretch from the north to the southeast of the country. As shown in the red areas in Figure 1, most licenses concentrate in two regions: the Pomeranian region in northern Poland at the coast of the Baltic Sea and the Lubelskie region in southeastern Poland. In the coming years, according to the license obligations, operators are expected to conduct 333 explorations drills, out of which 123 are obligatory and 210 are optional (Pliszczyńska, 2013, p. 334).

Public support for shale gas exploitation in Poland has been high, ranging from 59% in areas surrounding exploration activities to 78% at the country level (CBOS, 2013). In January 2013, 76% and 88% of the inhabitants in the Pomerania (Jackman & Sterczyńska, 2013, p. 383) and Lubelskie regions (Mieszkańcy Lubelszczyzny, 2013), respectively, supported shale gas exploration. However, exploration has sparked local protests—often already at the stage of seismic research. People living at the exploration sites tend to complain about insufficient information on the investment process and its implications for their daily lives,

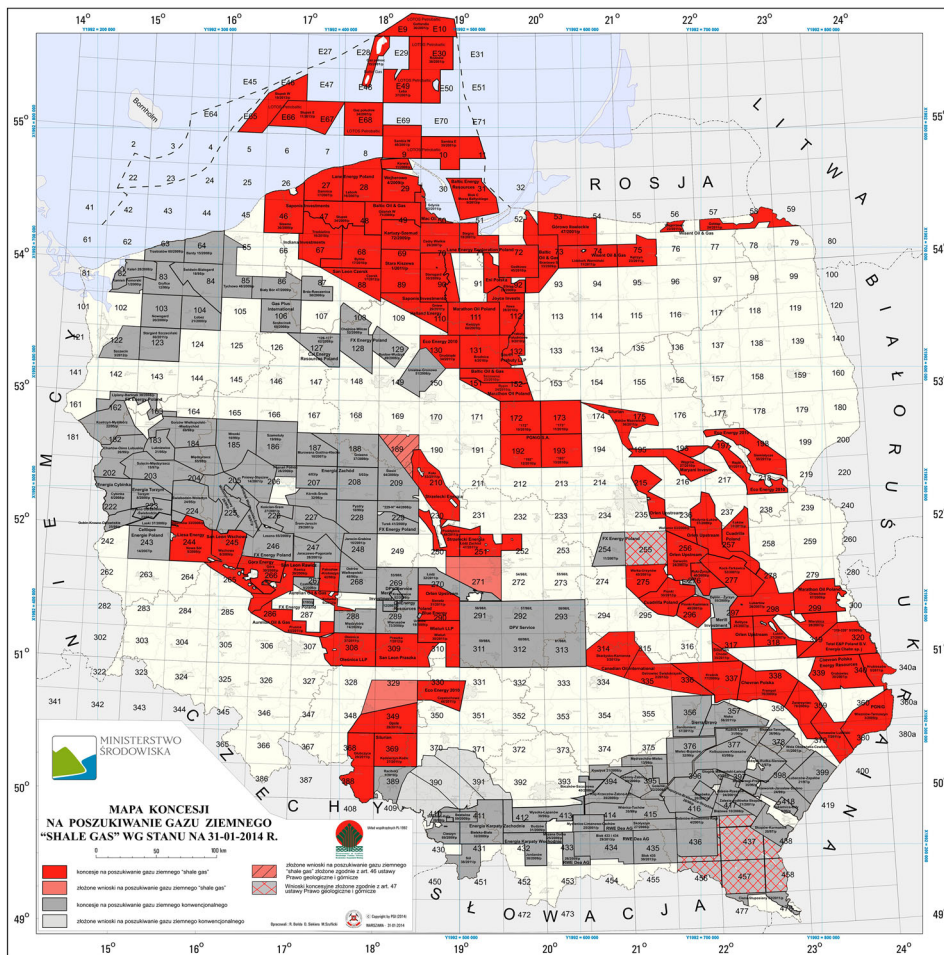


Figure 1. Shale gas drillings on the map of licenses for exploration of hydrocarbons deposits (as of February 1st, 2014).

Source: Ministry of Environment (https://www.mos.gov.pl/g2/big/2014_02/b941d42e456457a7d99d2cae61ff1843.jpg).

their health and the natural environment. Quite often, local communities learn about exploration activities when trucks arrive to set up a site.

Lack of communication has led to spontaneous protests as early as 2010 and resulted in the establishment of local and regional protest organizations and committees (Cirocki, 2011). These served as a vehicle for protests in other locations, spreading opposition across regions. Anti-shale gas actions receive support from national and international environmental organizations, such as No Fracking France or Food & Water Europe (Drewka, 2012). The pinnacle of their activities was the blockade of Chevron's site in Żurawłów (Lubelskie region) where a group of local farmers—supported by anti-shale gas activists from Poland and abroad—stopped exploration activities for more than one year.

Risk Communication Models and Policy Change

Originating from the work of Gregory Bateson (1955/1972), and developed by Goffman (1974), frames can be defined as 'mentally stored clusters of ideas that guide individuals' processing of information' (Entman, 1993, p. 53). They 'indicate wider contexts of meaning' (Feindt & Kleinschmit, 2011, p. 185), and give 'a perspective from which [. . .] a situation can be made sense of and acted on' (Rein & Schoen, 1993, p. 146). In other words, they 'open certain ways to act and curtail others' (Fischer, 2003, p. 47; see also Feindt & Kleinschmit, 2011, p. 187).

Our work draws on the public policy tradition of framing research (Rein, 1983a, 1983b; Rein & Schön, 1977, 1979/1993; Schön & Rein, 1994; Feindt & Kleinschmit, 2011). Policy studies applies frame analysis mainly as a way to study (conflicting) meanings of a problem, that is as 'a methodology for problem setting' (Rein & Schoen, 1977, p. 237), but it has also been used to study how reframing may result in new solutions to and resolutions of policy controversies (Rein & Schoen, 1986, 1993). In our study we focus on how the meaning of the shale gas issue is framed, and how actors' identities and relations are framed. By doing this we follow in the footsteps of van Hulst's and Yanow's (2014) who point out that one of the entities on which framing and re-framing operate are the identities and relationships of policy-relevant actors (pp. 11–12). We seek to understand how this framing makes some aspects of shale gas development come to be more relevant for policy-making than others, how this influences policy-decisions and the inclusion or exclusion of some frames and actors from shale gas debates.

Shale gas makes an interesting case for frame analysis. When speaking of shale gas development, people tend to think either about a resource—unconventional gas—or about a technology—hydraulic fracturing. This has important implications for political and policy action. Understanding shale as a resource directs action towards managing this resource. Seeing shale gas development mostly as a technique shapes action to manage the technology. Four questions for our study arise from this observation: Who in Poland frames the shale gas issue in economic or strategic terms (consistent with the two possible resource frames) and who frames it in terms of a technological threat? Do we observe these frames aligning and being reframed, or not? Which frames shape policy action? And, how can one explain the exclusion of some frames from becoming policy-relevant?

To complicate the whole picture, in Poland, energy policy is a highly securitized policy area with energy supply often framed as a problem of national security (Johnson & Boersma, 2013, p. 396). Cuts in energy supply are seen as

threatening the existence of the state (Johnson & Boersma, 2013, p. 396). All this sets the dynamics of energy policy controversies apart from other policy areas such as health care, schooling or taxation. The perceived 'technicality', 'complexity' and 'strategic importance' of shale gas exploitation structures the debate towards exclusion of those actors who 'do not understand' what energy technologies are about and what energy means for the nation state. This is quite clearly seen in the case of shale gas. Local anxieties about shale gas are not taken into account at the policy level since they are expressed by local people far removed from the strategic issues of national security. We are thus interested in examining how various actors in Poland frame the shale gas issue and, more generally why these conflicts, which are an important way of articulating interests in a democratic system, do not translate into a policy shift in case of shale gas in Poland.

To answer these questions, we connect frame analysis with two contrasting models of risk communication developed in the studies of Public Understanding of Science (PUS)—the deficit model and the participatory model (Hagendijk & Irwin, 2006; Kurath & Gisler, 2009; Palmer & Schibeci, 2012). The deficit model sees the lack of understanding and knowledge about certain technologies as the causes for hostility and opposition to them. It implies a division between experts with adequate knowledge and knowledge-deficient non-experts (Brown, 2009; Dickson, 2005; Irwin, 2006). Consequently, those who raise doubts are framed as in need of education by experts. This, in turn, excludes lay people from serious debates. In contrast, the participatory model puts different types of knowledge on an equal footing and accepts a wide range of concerns as relevant in technology assessment (Bauer, 2009; Stankiewicz, 2011; Sturgis & Allum, 2004; Wynne, 1989, 1998, 2006).

Hence, as part of the frame analysis, we will pay special attention to these two models that prescribe relations between actors in technological controversies. We argue for taking a step back to examine how actors are framed to become policy-relevant, and if actors are considered in need of education or need to be included in decision-making. In technological conflicts (see Saretzki, 2010) where debates are considered to be 'technical', 'complex' and 'strategic', the first issue at stake is who is competent to join the debate in a meaningful way. Whether one frames actors as ignorant or as experiential experts that need to be taken seriously, for example, is thus crucial for their legitimate participation in policy-relevant debates. Science communication models help us understand why in some countries civil society actors exert influence on shale gas policies and why in others they become excluded.

Methodology

The analysis is based on research carried out within a project funded by the Polish National Science Foundation titled *Governance of Technological Innovations: Interests in Deliberation, Deliberation on Interests*. Data examined in this article were collected between 2011 and 2014. We took part in 32 events through methods of participant observation, including stakeholder meetings in the Pomeranian region and in Warsaw. We conducted 12 in-depth interviews with experts, public authorities, NGO representatives and representatives from oil and gas companies and analysed various media and policy-relevant documents.

We started with a media analysis to identify shale gas frames in the mainstream, national media. We selected articles from the two biggest Polish daily broadsheets *Gazeta Wyborcza* and *Dziennik Gazeta Prawna*, and from the most

popular professional online magazine on energy *Wirtualny Nowy Przemysł*. Articles from these newspapers were selected using the keyword *gaz łupkowy* (shale gas). From *Gazeta Wyborcza* and *Dziennik Gazeta Prawna* a selection of articles was drawn through the Lexis Nexis database. Only those articles that are available in the printed version of the two newspapers were selected.

We compiled and analysed 45 articles (covering 27 January 2010 to 24 May 2013) from the *Gazeta Wyborcza*, and compiled 214 articles (covering 16 April 2010 till 5 July 2013) from the *Dziennik Gazeta Prawna* of which we sampled 31 for analysis through a systematic random sampling procedure. We also compiled a database of 47 articles from *Wirtualny Nowy Przemysł* using the search engine at the magazine's website all of which were analysed.

The analysis identified six main frames related to shale gas (1) 'shale gas is important for energy security', (2) 'shale gas is geopolitically game changing', (3) 'shale gas is economically viable', (4) 'shale gas is commercially viable', (5) 'there are concerns about environmental damage', (6) 'shale gas is controversial'. We reconstructed the following overarching frames: frames (1) and (2) together compose the energy security frame, frames (3) and (4) make the economic frame and frames (5) and (6) make the risk frame. Finally, we counted the number of articles in which these frames appeared.

Framing Shale Gas as a Commodity and an Object of National Security

The quantitative and qualitative analysis of shale gas frames, deployed by governmental and business actors in media articles, shows how the economic and security framings of shale gas dominated the debate and influenced policy-making.

The analysis of *Gazeta Wyborcza* (GW), *Dziennik Gazeta Prawna* (DGP) and *Wirtualny Nowy Przemysł* (WNP) shows that between 2010 and mid-2013, the state security frame dominated. The theme 'shale gas is geopolitically game-changing' occurred 21 times in GW, 10 times in DGP and 10 times in WNP (41 total), and the theme 'shale gas will enhance Poland's energy security' occurred 6 times in GW, 11 times in DGP and 10 times in WNP (27 total). The economic frame was also prominent. The theme 'shale gas is economically viable': was present in GW 18 times, in DGP 11 times and in WNP 15 times (in total 44 times), and the theme 'shale gas is commercially viable' occurred 4 times in GW, 2 times in DGP and 12 times in WNP (18 total). The least prominent was the risk frame. 'Concerns about environmental damage' were expressed 8 times in GW, 6 in DGP and 9 times in WNP (25 total), and statements that 'shale gas is controversial' were expressed 11 times in GW, 6 in DGP and 12 in WNP (29 total). These numbers are only indicators of what the debate on shale gas was about in these Polish newspapers. A qualitative analysis of narratives presented in articles helps us better understand the dynamics of the frames construction and their implications for the policy process.

Security: Energy Independence from Russia and Welfare

In 2010, framing shale gas as a unique chance for Poland to achieve independence from Russian gas supplies comes together with the expectations of lower energy prices and the boost for the Polish economy. Searching for shale gas is often compared to a 'gold rush' which reflects a great interest of foreign companies in Poland's shale gas reserves: 'in our country 'all the great ones of this world'— for example, Exxon Mobil, Chevron, ConocoPhillips, Marathon Oil Corp. are

looking for shale gas' (*W naszym kraju . . .*, 2010). Companies' interest in Polish shale gas reserves brought hopes for energy security, for example, when a journalist remarked, 'they will earn money and we will gain energy security' (GW, 27 January 2010, Wednesday). In 2010 there were many hopes that the shale gas business would be profitable for everyone—for the companies, for the Polish economy and for the energy security of Poland. The economic and the security frames seemed to align tightly.

A change in the debate came in 2011 when media released information that around 30% of shale gas licenses were held by companies with complex ownership structures making it difficult to determine who was responsible for operations in those sites. Media discovered that companies could easily fake the fulfilment of their license-related obligations (Mazurczak, 2014). It was not clear anymore whether companies' activities would automatically translate into the security of gas supplies for Poland. When in September 2011 information leaked that Russian capital may have been standing behind the license-holders and that Russia may have been trying to obstruct exploration processes in Poland, GW reframed shale gas as a predominantly security problem for Poland. As a response, the government issued a statement that Polish regulations would not let Russian companies block shale gas exploration.

Around those events, in the second half of 2011, the government set out to prepare a special law to regulate taxation from shale gas exploration (and other hydrocarbons) and to amend the Geological and Mining Law.¹ In mid-2012, the fear of Russia's interference into the Polish shale gas business was again substantiated when Exxon Mobil announced that it was moving out of Poland. GW commented: 'Maybe it is not convenient for Exxon to invest in Poland because this is not what Gazprom wants while holding its stranglehold on our gas supplies' (GW, 28 December 2010, Friday). At this moment, the economic and the security frames de-aligned. It was not so obvious any more that letting companies dig through the Polish territory would automatically result in welfare and security of energy supplies.

'Polish Shale' for Poland's Energy Security

In October 2012, the government presented premises for the new law regulating taxation for mining of hydrocarbons and amendments to the Geological and Mining Law. According to the government, current regulations did not assure an adequate level of supervision over companies looking for shale gas in Poland. The proposed regulations guaranteed the ownership rights of those who already had licenses, such as the right to preferential access (without participation in a tender) to the mining usufruct for holders of exploration-licenses who documented the existence of shale gas deposits (Malinowski, 2012).

The major change proposed at that time was to establish a new body called the National Operator of Energy Minerals NOKE (Narodowy Operator Kopalni Energetycznych) (Malinowski, 2012). NOKE would participate in each company's exploration activities as a business partner to help build a sustainable, long-term hydrocarbon economy in Poland. It would not exert control over companies' activities but would assure a better flow of information between investors and the Ministry of Environment. NOKE's participation in the application for an exploitation permit would not be mandatory but would depend on a company's individual decision (Mazurczak, 2014). Strategic resource security concerns were

the primary justification for these policy proposals. Some even started speaking of 'the Polish shale', meaning that shale gas is a strategic resource that should be fully controlled by the Polish state. With the proposal of NOKE, the energy security frame moved to the forefront. But at the same time, NOKE was the institution through which the security objectives of the government and the economic objectives of the companies were supposed to align.

The Pre-empted Risk Frame

Proposed regulations did not address environmental and technological risks. They focused on securing state control over shale gas exploration and production. Interestingly, the Ministry of Environment proposed to keep all activities related to shale gas under its own control, including the operation of NOKE. This, it hoped, would show Brussels that Poland governed shale gas from the environmental perspective and would pre-empt additional environmental regulations at the EU level. In November 2013, the Minister of Environment said that 'blocking shale gas exploitation by additional EU-level regulations would be disastrous for Poland' (Korolec: łupki, 2013). While the security and economic frames aligned, even if after some small crises, the environmental frame seemed incompatible with the government's goal of having shale gas production in Poland.

With the withdrawal of several companies from Poland in 2013, the government leaned towards provisions that would create more favourable conditions for companies, instead of securing state control over the shale gas business. The economic frame moved to the front of the debate. In May 2013, during a visit in Brussels, the Polish Prime Minister commented on the decision of ExxonMobil, Marathon Oil and Talisman to withdraw from exploration activities in Poland: 'We are looking for legal solutions that will attract investors so that we do not have companies fleeing Poland anymore' (Kublik, 2013). The Prime Minister empathized with companies' concerns. He turned to the Polish Minister of Environment by saying:

The Minister of Environment will either admit that this project [shale gas exploration] requires not only a mentality of an environmentalist but also a mentality of an entrepreneur, or someone else will take over this policy area. (...) If someone wants to invest billions in Poland, they should have a stable business environment here. (Kublik, 2013)

It is interesting that the Prime Minister referred to the 'environmental' consciousness of the Environment Minister, which, with regard to shale gas, had never actually been presented in public. With this comment, the Prime Minister signalled a more business friendly approach to shale gas policies. At the end of 2013, the Minister of Environment was replaced with the objective to conclude the work on shale gas regulations (Chmal, 2014).

In March 2014, the government presented new regulations for shale gas exploration and exploitation. It proposed one license for exploration and exploitation activities, tax exemptions for companies exploiting shale gas until 2020 and quite attractive tax rates for mining and commercial gains in the exploitation phase. The government also abandoned the idea of NOKE (Sawicki, 2014b). Retreat from this idea was promoted mainly by the new Minister of Environment who instead proposed to strengthen the role of the Higher Mining Office over unconventional mining (Rząd rezygnuje, 2014). The impact of the multi-interpretable

security frame on policy proposals was weakened again. Some even commented that ‘no NOKE’ meant the end of a dream about the ‘Polish shale’ and, as one expert said ‘without NOKE the Polish shale gas sector is a European Eldorado’ (Mazurczak, 2014). This way, the energy security frame went to the background of the policy process.

As the above analysis has shown, the policy-relevant debate developed within two dominant frames: the energy security frame and the economic frame, which sometimes aligned and sometimes de-aligned. The risk frame did not shape the policy debate. As a consequence, the shale gas policy process in Poland dealt more successfully with economic and security-related aspects of shale gas understood as an energy resource. It left out, and even pre-empted, regulations that would have addressed shale gas development in its technological and environmental aspects, and as such environmental threat.

Framing Shale Gas as a Source of Risk

Even though at the policy level, environmental risks seemed irrelevant; framing of technological and environmental risks did take place at the local level in three types of activities: local protests; actions of environmental organizations cooperating with local communities; and local and regional dialogue initiatives, organized by public authorities and gas companies. Local attention shifted from shale gas as a resource to the (risky) technology of its production. The ‘risk frame’ posits shale gas either as a dangerous threat out of control or as a possible source of threat. In the former case, ‘threat’ refers to a perception of shale gas extraction as definitively and unavoidably dangerous; in the latter meaning the emphasis is on the mere possibility of dangerousness captured in the more moderate term ‘risk’. There is ambiguity of this frame, but ‘risk’ is a broader term that captures both a definitive and a possible ‘threat’.

Shale Gas as a Dangerous Thing Out of Control

The more radical threat frame presents fracking as dangerous and beyond the control of state agencies. As such it does not leave room for uncertainty or riskiness, since the harmful consequences of fracking are perceived as proven. A manifesto of an anti-shale gas movement, *Złupieni.pl*, demands:

a moratorium or a complete ban on hydrocarbons exploration and exploitation using the method of hydraulic fracturing, the **harmfulness of which, for people and the environment, has been researched and documented without any doubts** in France and in Germany, as well as during exploitation activities in USA, Canada and Australia (written statement presented during public hearing in Gdańsk, 1 October 2013—emphasis added)

This framing often comes to local communities and environmental NGOs in Poland from international actors. A statement by Jose Bove, serves as a good example here:

You want to know if there are any doubts? No, there are no doubts. We know that this technology is harmful, that it’s dangerous and we know

that there is no other way to exploit the deposits. (quoted in Bove & Horoszkiewicz, 2011)

Framing fracking as out of control can be found in statements of environmental organizations and community protest groups. Geographically, these frames spread through agricultural regions, such as Lubelskie, and areas that attract tourism such as Kaszuby in the Pomeranian region. Kaszuby, known for its beauty, is commonly called 'the Kashubian Switzerland'. There, the local protest movement coined a catchy anti-fracking slogan: 'We don't allow them to make a Swiss cheese out of Kaszuby'. Fracking is seen as polluting land surface, soil and drinking water, and thus to the destruction of living conditions, and agricultural and touristic values in the area (Krowicki, 2013). It is also stressed that shale gas exploitation will expose people and animals to various health hazards, and the climate system to the increased H₂S and SO₂ emissions (see Cirocki, 2011; Krowicki, 2013) (Figure 2).

Shale Gas as a Possible Threat

The second, less radical threat frame stresses uncertainty and the unknown aspects of shale gas extraction. Risks are difficult to predict (see Wynne, 2006). Contrary to the previous frame, this less radical frame does not say definitely that fracking is dangerous, but rather that it may turn out to be such after it has been thoroughly tested. Shale gas opponents within this frame point to a relative novelty of fracking in Poland and its possible unintended consequences (Opo-

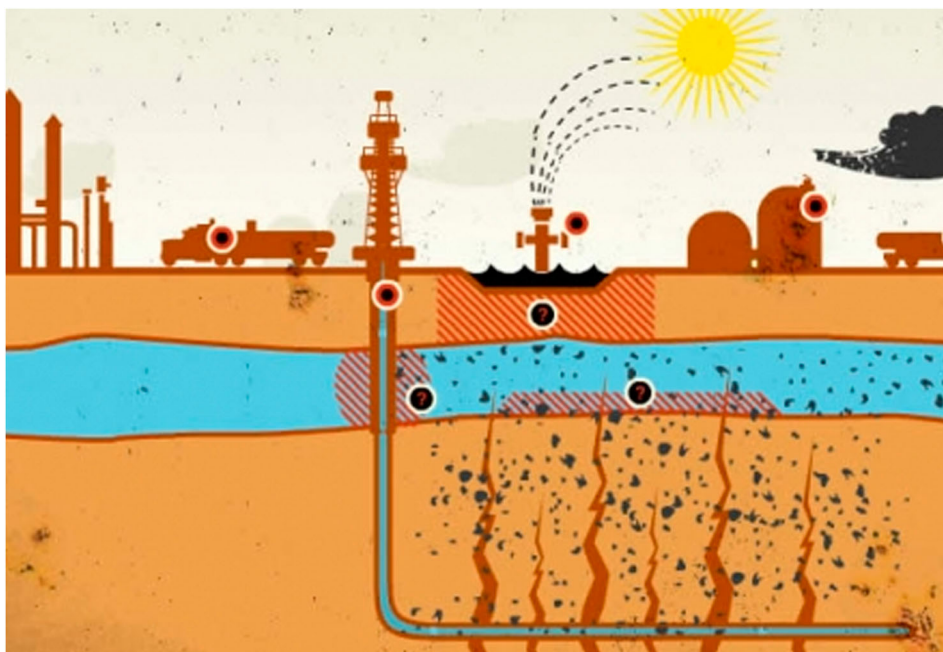


Figure 2. Picture from an anti-fracking website presenting the consequences of fracking for the environment (Retrieved April 2014, from <http://www.ukrytaprawda.com/gaz-lupkowy-4-nauczki-z-usa/>) (page 11).

wieść, 2014). One of the participants at a public meeting organized by the state-owned gas company PGNiG in Przywidz in March 2012 said:

This method should be thoroughly tested before the first drilling will have been done! One should know what will happen to the water. We are not some experimental guinea pigs.

This framing exposes particularities of shale gas business in Poland in comparison to other countries. For example, an argument is that shale reserves are situated deeper underground in Poland than in the US. Second, Poland is more densely populated than the US and third, Poland does not have standards and regulations for governing various aspects of shale gas business.

Why Shale Gas is Not Risky . . . Because Everything is Under Control

Risk frames constructed by the local actors and civil society groups were countered by experts, company representatives and politicians. Most commonly, company representatives and public authorities stated that all risks are technically manageable. This approach is represented by both the foreign companies using mainly American technologies (e.g. Talisman, Exxon Mobil, Haliburton) and the Polish companies operating on conventional gas resources (e.g. PGNiG, Geofizyka).

The argument of the old, proven American technology comes with references to the US's long-term experience with fracking (Sonik, 2012). Polish experts claim that there have been thousands of drills completed in the US and fracking has been used for many years without serious negative consequences (Pasztelański, 2012). In a similar vein, Polish experts and companies argue that shale gas is nothing new for Poland, which has been drilling for natural gas for decades. A reference is often made to the fairly well-developed state of the Polish gas sector with several state-owned and private companies.

Representatives of Polish gas companies tend to use the argument that in Poland thousands of drills (although for conventional gas) have already been made in the last half of the century without any signs of unexpected harms and damage (PGNiG, 2013). It is very often repeated that 'shale gas is the same gas as natural gas', the only difference is its geological location:

There is no difference in technology. There is only a difference in the scale of its usage. (a local meeting in the Pomerania Region, January 2013)

The vice-president of the board in PGNiG stressed in a media interview:

For 160 years Polish people have known how to exploit hydrocarbons safely and economically, thus we can also exploit shale gas. (quoted in: PAP, 2011)

A specialist representing PGNiG at a meeting in Przywidz in March 2012 assured the local citizens that:

Thousands of drills can be counted in Poland. And so what? And nothing. The drills have been conducted for one hundred years. We should remember that the oil industry was born in Poland (. . .). We have one of the best and biggest experience in oil industry, on the contrary to the French people, who have the biggest gas deposits in Europe but no drills, the last one was done 60 years ago. (public meeting in Przywidz, March 2012)

In addition, the environmental risk frame is countered from a legal perspective. Proponents argue that shale gas is already subjected to existing administrative regulations that are properly implemented. When discussing the chemical composition of fracking fluids, chemical companies, such as Dow Chemical, stress the fact that these chemical substances have been used in other contexts and regulated by the EU REACH Directive. Christoph Sikora, the CEO for the Central European region of Dow Chemical Company, stated that

the EU has the REACH system and we are not using any mysterious substances – all are commonly known. (quoted in: Malinowski, 2014)

Local public authorities have come up with similar legalistic responses and draw attention to the number of regulations and regulatory institutions responsible for environmental protection in Poland. After a study visit to the shale gas exploitation areas in Canada a representative of local authorities said:

If they had our system of environmental protection, with our laws, rules and institutions, most of the drills would have been closed. (public meeting in Gdansk, March 2013)

During a local public discussion on shale gas, another specialist in geology stressed that:

Everything is under control, there are a lot of institutions regulating and monitoring activities of gas companies; they need to get a lot of permissions to do every next steps, all of them are carefully watched. (local meeting in Pomerania region, January 2014)

Both the references to earlier experiences with fracking and to the existing legal framework are responses to the accusations formulated within risk frame that shale gas exploration is 'out of control' of the regulatory institutions. They both constitute two pillars of a 'defense' against the risk frames and are based on the assumption that experts (scientists and engineers) should have a decisive role in solving technological controversies and that the public needs to be educated.

Excluding Actors, Excluding Frames

We now turn to the two science communication models and how actors are positioned in the framing processes we described in the above section. We can clearly see that a mutual distrust lurks behind the three dominant frames. From an environmental risk perspective mostly held by local communities and civil society groups, public authorities and experts cannot be trusted. State regulatory and control bodies are seen as incapable of securing proper conduct of shale gas exploration activities. Local actors stress the lack of experience with this kind of risk in Poland, pointing to institutional deficits (e.g. not enough specialists employed in environmental agencies) and blaming decision-makers for being corrupted by oil and gas companies. According to an opinion survey conducted by the Polish Geological Institute in 2013, one third of Poles believed that public regulatory institutions were not able to secure environmentally safe exploitation of shale gas (Stankiewicz & Stasik, 2014). On the other hand companies do not believe in the competence of local people and claim to be the experts that local people have to trust.

It should not come as a surprise that local communities and civil society groups frame shale gas exploration as a threat, for example, by speaking of it as

a societal experiment where nobody knows its effects (Krohn & Weyer, 1994). This results from distrust towards decision makers and a fear of being deceived and exploited. At the same time, proponents of the environmental risk frame criticize the way shale gas is presented by the state and by gas companies that do not acknowledge any risk or dangers (Lemann, 2011). However, as we will demonstrate, this emphasis on risk is not necessarily an anti-fracking frame. Local communities first and foremost want to work out appropriate solutions, standards and regulations that will correspond with the risky character of fracking.

What may contribute to distrust are deficits in communication that include a lack of information but also a lack of acknowledgement of (experiential) expertise and competence of citizens by companies. This antagonizes stakeholders from the beginning by dividing them into proponents and opponents. As a result, a polarized spectrum of risk communication emerges, which is characteristic of the deficit model. On the one side there are the 'knowing' experts who are proponents, and on the other side there are the opposing 'not-knowing' lay people.

This connection between communication deficits and the distrust in government and companies can be illustrated by a situation in Żurawłów in south-east Poland, where a group of local farmers blocked the Chevron drilling site for almost 400 days in 2013–2014. The conflict started because inhabitants were not informed about exploration activities in advance. The conflict culminated during an information meeting organized by Chevron and local authorities, which was abruptly ended by the gathered people. After that meeting communication between the company and the community ceased completely. After the blockade, which ended with Chevron's withdrawal from the area, the company sued 13 local inhabitants for disturbing exploration activities. Local inhabitants commented in a newspaper:

We started to read about shale gas on our own, what this is all about (...). We already then knew a lot about the exploitation technologies. We asked precise questions, which were left without any answers. (...) They [Chevron] thought that some stupid people live here. Stupid people who don't know anything. And people here are not stupid. It's enough to check the Internet to find out about fracking. (Pajuro, 2014)

The division between these two conflicting parties led to oppositional positioning of the involved actors within a frame. The protesting local inhabitants and civil society actors framed the experts, authorities and entrepreneurs as not trustworthy, legitimate partners in a discussion, accusing them of remorseless exploitation of local resources, regardless of their environmental, agricultural, touristic and cultural values:

Shale gas will be extracted for 5, 10 years, maybe longer, and afterwards the company will go away while the people will stay (...). One cannot come and do business without taking into consideration, that people have been living here. (interview with a citizen, quoted in Suchomska & Stankiewicz, 2013, 29)

On the other hand, companies, experts and decision-makers considered local communities and environmental NGO's as incompetent, uneducated, stubborn and as prone to protest against everything new. Companies repeatedly accused inhabitants of NIMBYism:

There is a very deep opposition in Polish society against every new investment which upset the status quo. (representative of an oil and gas company, Polish Energy Summit April 2013)

Their concerns and obligations related to shale gas were seen as resulting from a lack of knowledge and comprehension of complicated technological issues. This elite position was reinforced in media, which supported shale gas exploration and often criticized protesters. A title of one press article is telling: 'Will the shale gas psychosis stop the scientific program?' (Malczuk, 2012).

Often in Poland, experts are viewed as arbiters in technological controversies, while lay people are seen as too incompetent to participate in discussions. Mucha (2009), in research about scientists from one of the largest Polish technical universities, has convincingly shown that the deficit model of science communication structures unequal relations between the lay public and experts in technological controversies in Poland.

According to the deficit model, experts should take on the role of arbiters in technological controversies, while lay people are excluded as too incompetent to participate in the discussion. Lay knowledge and perspectives are seen as not relevant and often irrational, if not directly hostile and contrary to the Polish interest. For example, there are more or less open accusations of opponents of shale gas being Russian agents paid by Gazprom:

People who organise the protest are driven only and solely by their own interest, acting in favour of an enemy country. (Franciszek Kawa, mayor of Susiec, quoted in: Szydłowski, 2014)

As a consequence, communication with local communities, even if called 'dialogue', is becoming a tool to convince people to accept shale gas exploration. This smooth shift from 'dialoguing' to 'convincing people' can be seen in this statement of the Chief Environmental Protection Inspector of Poland, Andrzej Jagusiewicz:

Dialogue with local communities is a task for companies. They must keep on convincing people that there are more gains than possible threats. (quoted in: Dominowski, 2011)

Domination of the deficit model effectively prevents stakeholders from participating in decision-making processes, and thus from representing alternative, local frames in policy and planning areas. As a representative of a gas company publicly expressed during a local meeting in Pomerania region in October 2014:

We cannot agree for any form of public participation of local communities in decision-making procedures, because we are simply afraid that incompetent people will have an impact on it.

This approach is not specific to investors, but is strengthened also by public authorities. Minister of Environment, Maciej Grabowski, said once during a visit at a drilling site:

The biggest problem in shale gas exploitation is public resistance. (quoted in: Minister środowiska, 2014)

Such oppositional framing excludes people by excluding their knowledge, as Sojak and Wicenty (2005) described it. Exclusion of the lay public from shale gas debates in Poland excluded the risk frames, which consequently did not contribute to policy processes.

This asymmetry between experts promoting shale gas exploration on one hand, and protesting local citizens and environmental activists on the other, occurs not only in the public utterances of investors, drilling companies, experts, and governmental actors, but is also reproduced in the practice of limiting participation in public consultations. For example, a new law on hydrocarbons, proposed in 2013, included changes in regulations concerning the access to information about the environment. It introduced a requirement that only NGOs in existence for over one year could inform environmental impact assessments. The new limitations will exclude local emerging organizations from participating in administrative procedures and will consequently hamper the development of civil society organizations on the local level (Konsultacje, 2014). As the representatives of the environmental movement pointed out, newly founded organizations of local actors, which are often established when a new controversial investments are initiated, will be excluded and shale gas is a good example. However, the gas sector sees the limitations as not strict enough, and would likely restrict nationwide organizations from participation on the local level:

The changes should go further (...). Now a foundation or association from Warsaw can deliver reservations in every case in the whole country. (Maciej Zięba, general director of the Polish Exploration and Production Industry Organisation, quoted in Zieliński & Duszczyk, 2013).

The main motivation behind these changes to the law was to fight 'ecoterrorism', a label used to describe environmental protests that have stopped various investment projects. This term is especially popular among journalists who generally support the shale gas boom in Poland. One press article is titled: 'The government is hitting the ecoterrorists. They won't block the investment' (Zieliński & Duszczyk, 2013). This term seems related to the security frame.

Conclusions

Two dominant frames shaped the policy process on shale gas in Poland, the security frame and the economic frame. These frames, mostly held by investors, experts and national governmental actors, have posited shale gas as a resource important for the national and global economy and for energy security. In accordance with these frames, the Polish government pre-empted a possible policy shift towards regulating the use of fracking from the EU level by assigning all aspects of shale gas development to the Ministry of Environment. The Ministry of Environment was supposed to guarantee that no additional measures from the European Union were needed to safeguard the environment against fracking.

However, concerns about risks of fracking came from within Polish society. Although no nation-wide protests have been noted so far, communities and civil society organizations at the exploration sites expressed worries. They framed shale gas as posing inevitable or possible threats to the environment and people, and demanded withdrawal of the exploration activities or new standards and measures for their management. Despite local opposition and conflicts, such as the one in Żurawłów, shale gas policy in Poland remains solely within the economic side of the shale gas issue. While the concerns of companies have been seriously taken into account by the central government and thus have influenced a policy shift towards a more business-oriented policy, concerns of local communities and civil society actors were perceived as misconceived or even irrelevant.

Shale gas development and its technical aspects were left under existing regulations.

In this article, we explain the lack of incorporation of risks into policy by examining how different actors actively framed shale gas in the Polish debate and as part of this framing process, positioned each other either from a deficit model of science communication or a participatory model. We demonstrated that interactions at the local level reflected the deficit model of risk communication. Experts and companies' representatives defined their roles as teachers of the incompetent public. Not only was the public considered in need of knowledge and information, but also as not competent to take part in decision and policy processes. The decision-makers, supported by experts and companies' representatives set out to persuade people that everything was under control, giving a number of knowledge-based and experience-based arguments. The distance and division between those who decide and those who have to live close to the investment site was deepened by a general distrust in public authorities expressed by the local actors. Sometimes even open references to eco-terrorism and environmentalists collaborating with enemy-states or being a threat to state-security also contributed effectively to the exclusion of framing fracking as an environmental risk from the debate. This deepened the controversy and positioned actors expressing environmental concerns immediately in the anti-fracking camp. As a result, fracking as a technology could be kept away from becoming an environmental issue related to the policy-making on shale gas in Poland. Polish shale gas policies, which have been designed and implemented for the last couple of years, focus on economic issues and on securing a new resource for the nation state.

Our findings emphasize the importance of examining relations between stakeholders when analysing policies regulating energy technologies. Models of science and risk communication usefully explain why in some areas or in some societies the voice of non-experts shapes the policy process and in others it remains localized without influence. Models that are reproduced in a given society—the deficit and the participatory models—reflect historic patterns that have developed and have been institutionalized in practices of scientific institutions, expert bodies and governments. These traditions shape contemporary policy processes and are good indicators for the quality of democratic systems. As such, models of risk communication help us explain why some frames are excluded from policy-making processes, while other frames shape it. The deficit model excludes non-expert and non-elite actors, while the participatory model is more inclusive. In the participatory model, inclusion of concerns and knowledge expressed by civil society organizations may cause a policy shift that better includes environmental issues in decision-making on shale gas, as happened, for example, in the Netherlands (see Metze, 2014). The Polish case shows the opposite—actors who speak about risks of fracking and of the corresponding frames were excluded from the policy process.

Acknowledgement

We would like to thank all our interviewees who kindly dedicated time and effort to explain to us intricate issues of shale gas development in Poland.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This paper was written with the support of the National Science Centre under Grant DEC-2013/11/D/HS6/04715 decision and under Grant decision number DEC-2011/03/B/HS6/04032.

Note

1. Most of the articles on taxation in the reviewed newspapers appeared from October until December 2011.

References

- Bauer, M. W. (2009). The evolution of public understanding of science—Discourse and comparative evidence. *Science, Technology & Society*, 14(2), 221–240.
- Bove, J., & Horoszkiewicz, A. (2011). Gaz łupkowy to fałszywe bogactwo. *Zielone Wiadomości*. Retrieved March 2014, from <http://zielonewiadomosci.pl/tematy/energetyka/gaz-lupkowy-to-falszywebogactwo/>
- Brown, S. (2009). A new deficit model. *Nature Nanotechnology*, 4, 609–611.
- CBOS. (2013). *Spółeczny stosunek do gazu łupkowego*. Public opinion research conducted in May 2013. Warszawa: Fundacja Centrum Badania Opinii Społecznej. Retrieved October 1, 2013, from http://www.cbos.pl/SPISKOM.POL/2013/K_076_13.PDF
- Cirocki, B. (2011, November 11). Gmina Stężycza nie chce zysków z gazu łupkowego. *Dziennik Bałtycki*.
- Chmal: rząd słusznie zrezygnował z NOKE. (2014). *Łupki Polskie*. Retrieved March 2014, from <http://gazlupkowy.pl/chmal-rzad-sluszenie-zrezygnowal-z-noke/>
- Dickson, D. (2005). The case for a “deficit model” of science communication. *SciDev. Net*. Retrieved November 13, 2014, from [http://medsci.free.fr/docsderef/Dickson2005_Deficit model of science communication.pdf](http://medsci.free.fr/docsderef/Dickson2005_Deficit%20model%20of%20science%20communication.pdf)
- Dominowski, K. (2011, July 6). Kto i kiedy zarobi na polskich złożach gazu łupkowego? *Dziennik Gazeta Prawna*. Retrieved November 14, 2014, from <http://edgp.gazetaprawna.pl/index.php?act=mprasa&sub=article&id=367709>
- Drewka, W. (2012, February 27). Elisabeth Bourgue: Gaz łupkowy nie da korzyści lokalnej społeczności. *Express Kaszubski*.
- Energy Information Administration. (2011). World shale gas resources: An initial assessment of 14 regions outside the United States. Retrieved January 2014, from <http://www.eia.gov/analysis/studies/worldshalegas/archive/2011/pdf/fullreport.pdf>
- Entman, R. M. (1993). Framing. *Journal of Communication*, 43, 51–58.
- Feindt, P. H., & Kleinschmit, D. (2011). The BSE crisis in German newspapers: Reframing responsibility. *Science as Culture*, 20(2), 183–208.
- Feindt, P. H., & Saretzki, T. (Eds.). (2010). *Umwelt und Technikkonflikte*. Wiesbaden: VS Verlag.
- Fischer, F. (2003). *Reframing public policy*. New York, NY: Oxford University Press.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. London: Harper and Row.
- Hagedijk, R., & Irwin, A. (2006). Public deliberation and governance: Engaging with science and technology in contemporary Europe. *Minerva*, 44, 167–184.
- van Hulst, M., & Yanow, D. (2014). From policy “frames” to “framing”: Theorizing a more dynamic, political approach. *American Review of Public Administration*. Advance online publication. doi:10.1177/0275074014533142.
- Irwin, A. (2006). The politics of talk coming to terms with the “new” scientific governance. *Social Studies of Science*, 36(2), 299–320. doi:10.1177/0306312706053350
- Jackman, M., & Sterczyńska, S. (2013). Gaz z łupków w oczach mieszkańców, samorządów, koncesjonariuszy i instytucji województwa pomorskiego. *Przegląd Geologiczny*, 61(1), 381–385.
- Johnsna, C., & Boersma, T. (2013). Energy (in)security in Poland the case of shale gas. *Energy Policy*, 53(February), 389–399.
- Konsultacje specustawy węglowodorowej – nasze stanowisko. (2014, October 22). *Strefa Zieleni*. Retrieved November 21, 2014, from <http://strefazieleni.org/konsultacje-specustawy-weglowodorowej-nasze-stanowisko/>
- Korolec: łupki powinny być pod kontrolą Ministerstwa Środowiska. (2013). *FORBES*. Retrieved March 2014, from <http://www.forbes.pl/korolec-sektorem-lupkowym-powinno-zarzadzac-ministerstwo-srodowiska,artykuly,166465,1,1.html>

- Krohn, W., & Weyer, J. (1994). Society as a laboratory: The social risks of experimental research. *Science and Public Policy*, 21(3), 173–183.
- Krowicki, G. (2013). 7 zagrożeń związanych z wydobywaniem gazu łupkowego. Retrieved July 1, 2013, from <http://zielonewiadomosci.pl/tematy/energetyka/zagrozenia-zwiazane-z-wydobywaniem-gazu-lupkowego-w-polsce/>
- Kublik, A. (2013, May 24). Kto opóźnia łupki? *Gazeta Wyborcza*.
- Kurath, M., & Gisler, P. (2009). Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology. *Public Understanding of Science*, 18(5), 559–573.
- Lemann, H. (2011). Jak coś znajda, to koniec. *Tygodnik Przegląd*. 46/2011.
- Malczuk, B. (2012, September 18). Czy łupkowa psychoza zahamuje program naukowy? *Słowo Podlasia*, 37/2012. Retrieved October 16, 2012, from www.slowopodlasia.pl
- Malinowski, D. (2012). *Po co w gazie łupkowym Narodowy Operator Kopalni Energetycznych?* WNP. Retrieved March 2014, from http://gazownictwo.wnp.pl/po-co-w-gazie-lupkowym-narodowyoperator-kopalni-energetycznych,181697_1_0_0.html
- Mazurczak, M. (2014). *Bez NOKE polski sektor łupkowy to europejskie Eldorado. Łupki Polskie*. Retrieved March 2014, from <http://gazlupkowy.pl/bez-noke-polski-sektor-lupkowy-to-europejskie-eldorado/>
- Metze, T. (2014). Fracking the debate: Frame shifts and boundary work in Dutch decision making on shale gas. *Journal of Environmental Policy & Planning*. Advance online publication. doi:10.1080/1523908X.2014.941462
- Mieszkańcy Lubelszczyzny popierają wydobywanie gazu łupkowego, *ŁupkiPolskie.pl*. 2013. Retrieved March 26, 2013, from www.lupkipolskie.pl/aktualnosci/newsy-z-polski/03-2013/mieszkanicy-lubelszczyzny-popieraja-wydobywanie-gazu-lupkowego#
- Minister środowiska zapewnia: wydobywanie łupków jest bezpieczne. (2014, September 9). *Dziennik Gazeta Prawna*. Retrieved November 21, 2014, from <http://gospodarka.dziennik.pl/news/artykuly/469344,maciej-grabowski-wydobycie-lupkow-jest-bezpieczne.html>
- Mucha, J. (2009). *Uspołeczniona racjonalność technologiczna. Naukowcy z AGH wobec cywilizacyjnych wyzwań i zagrożeń współczesności*. Warszawa: Wydawnictwo IFiS PAN.
- Olkuski, J. (2013). Złoża gazu niekonwencjonalnego w Polsce - prognozy i postępy w poszukiwaniach. In K. Szpak & P. Musiałek (Eds.), *Polska Energetyka 2012* (pp. 21–24). Kraków: Centrum Analiz Energetycznych.
- Opowieść byłego nafciarza. (2014, January 16). *Gaz Łupkowy - Wiadomości*. Retrieved November 21, 2014, from <http://gazlupkowy.info.pl/opowiesc-bylego-nafciarza/>
- Pajuro, E. (2014, July 14). *Chevron wyjechał, Żurawłów odetchnął, Polska Kurier Lubelski*. Retrieved November 21, 2014, from <http://www.kurierlubelski.pl/artukul/3505167,poszukiwania-gazu-lupkowego-chevron-wyjechal-zurawlow-odetchnal-zdjecia,id,t.html>
- Palmer, S. E., & Schibeci, R. (2012, August 24). What conceptions of science communication are espoused by science research funding bodies? *Public Understanding of Science*. Advance online publication. doi:10.1177/0963662512455295
- PAP. (2011, September 29). *Karabula: potrafimy bezpiecznie i ekonomicznie wydobywać gaz z łupków, Bankier.pl*. Retrieved January 29, 2014, from <http://www.bankier.pl/wiadomosc/Karabula-potrafimy-bezpiecznie-i-ekonomicznie-wydobywac-gaz-z-lupkow-2414358.html>
- Pasztelański, R. (2012, October 31). *Łupki – szansa czy zagrożenie dla Polski, TVP Info*. Retrieved January 28, 2014 from <http://www.tvp.info/8969887/lupki-szansa-czy-zagrozenia-dla-polski>
- PGNiG o łupkach: “W przypadku jakichkolwiek zniszczeń, naprawiamy je zaraz”. (2013, November 18). *Portal Samorządowy*.
- Pliszczyńska, K. (2013). Poszukiwanie i rozpoznawanie niekonwencjonalnych złóż węglowodorów – stan prac i działania Ministerstwa Środowiska. *Przegląd Geologiczny*, 61(6), 334–337.
- Rein, M. (1983a). *From policy to practice*. London: Macmillan.
- Rein, M. (1983b). Value-critical policy analysis. In D. Callahan & B. Jennings (Eds.), *Ethics, the social sciences, and policy analysis* (pp. 83–111). New York, NY: Plenum Press.
- Rein, M., & Schön, D. A. (1977). Problem setting in policy research. In C. H. Weiss (Ed.), *Using social research in public policy making* (pp. 235–251). Lexington, MA: Lexington Books.
- Rein, M., & Schön, D. A. (1986). “Frame-reflective policy discourse”. *Beleidsanalyse*, 4, 4–18.
- Rein, M., & Schön, D. A. (1993). Reframing policy discourse. In F. Fischer & J. Forester (Eds.), *The argumentative turn in policy analysis and planning* (pp. 145–166). Durham, NC: Duke University Press.
- Rutkowski, M. (2013). Gaz pojawia się i znika, czyli krótka historia szacowania zasobów węglowodorów niekonwencjonalnych w Polsce. *Przegląd Geologiczny*, 6(61), 331–333.
- Rząd rezygnuje z koncepcji powołania NOKE. (2014). *Puls Biznesu*. Retrieved March 2014, from <http://www.pb.pl/3547827,74653,rzad-rezygnuje-z-koncepcji-powolania-noke>

- Saretzki, T. (2010). Umwelt und Technikkonflikte: Theorien, Fragestellungen, Forschungsperspektiven. In P. H. Feindt & T. Saretzki (Eds.), *Umwelt und Technikkonflikte* (pp. 33–53). Wiesbaden: VS Verlag.
- Sawicki, B. (2014a). Coraz mniej zainteresowanych łupkowymi koncesjami. *Łupki Polskie*. Retrieved April 2014, from <http://gazlupkowy.pl/coraz-mniej-zainteresowanych-lupkowymi-koncesjami/>
- Sawicki, B. (2014b). Sawicki: Dyskusja o NOKE powróci. *BiznesAlert*. Retrieved April 2014, from <http://biznesalert.pl/sawicki-dyskusja-o-noke-powroci/>
- Schön, D. A. (1979/1993). Generative metaphor. In A. Ortony (Ed.), *Metaphor and thought* (2nd ed., pp. 137–163). Cambridge: Cambridge University Press.
- Schön, D. A., & Rein, M. (1994). *Frame reflection*. New York, NY: Basic Books.
- Sojak, R., & Wicenty, D. (2005). *Zagubiona rzeczywistość. O społecznym konstruowaniu niewiedzy*. Warszawa: Oficyna Naukowa.
- Sonik, B. (2012, June 5). Złota era gazu łupkowego. *Rzeczpospolita*.
- Stankiewicz, P. (2011). Od przekonywania do współdecydowania: zarządzanie konfliktami wokół ryzyka i technologii. *Studia Socjologiczne*, 4(203), 95–120.
- Stankiewicz, P., & Stasiak, A. (2014). *Raport: poszukiwanie i wydobycie gazu łupkowego w Polsce – wiedza, opinie, oceny*. Warszawa: Państwowy Instytut Geologiczny. Retrieved August 13, 2014, from http://infolupki.pgi.gov.pl/sites/default/files/czytelnia_pliki/1/sondaz_pig_raport_gaz_lupkowy.pdf
- Sturgis, P., & Allum, N. (2004). Science in society: Re-evaluating the deficit model of public attitudes. *Public Understanding of Science*, 13(1), 55–74.
- Suchomska, J., & Stankiewicz, P. (2013). *Wsparcie samorządu gminnego w dialogu obywatelskim w kontekście planowanego wydobycia gazu z łupków*. Raport z badania społecznego, Pracownia Zrównoważonego Rozwoju, Toruń 2013. Retrieved August 13, 2014, from <http://www.razemolupkach.pl/sites/default/files/Raport%20z%20badania%20-%20pilota%20C5%BC%20Razem%20o%20C5%81upkach%20PZR.pdf>
- Szydłowski, J. (2014, August 25). Łupkowy front przენosi się na Roztocze. *Dziennik Wschodni* No. 162. 25.08.2014
- W naszym kraju... (2010, January 2010). *Gazeta Wyborcza*.
- Wynne, B. (1989). Sheepfarming after chernobyl: A case study in communicating scientific information. *Environment*, 32(3), 11–39.
- Wynne, B. (1998). May the Sheep Safely Graze? A Reflexive View of the Expert–Lay Knowledge Divide. W: S. Lash, B. Szerszynski, B. W. Wynne (red.) *Risk, Environment and Modernity: Towards a New Ecology*. SAGE.
- Wynne, B. (2006). Public engagement as a means of restoring public trust in science – Hitting the notes, but missing the music? *Public Health Genomics*, 9(3), 211–220.
- Zieliński, R., & Duszczyk, M. (2013, March 20). Rząd uderza w ekoterrorystów. Nie zablokują inwestycji. *Dziennik Gazeta Prawna*. Retrieved November 21, 2014, from <http://gospodarka.dziennik.pl/news/artykuly/422614,rzad-uderza-w-ekoterrorystow-nie-zablokuja-inwestycji.html>