Project Acronym and Title:

M4ShaleGas - Measuring, monitoring, mitigating and managing the environmental impact of shale gas

EXISTING EUROPEAN DATA ON PUBLIC PERCEPTIONS OF SHALE GAS

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Public introduction

M4ShaleGas stands for *Measuring, monitoring, mitigating and managing the environmental impact of shale gas* and is funded by the *European Union's Horizon 2020 Research and Innovation Programme*.
The main goal of the M4ShaleGas project is to study and evaluate potential risks and impacts of shale gas exploration and exploitation. The focus lies on the four main areas of potential impact: the subsurface, the surface, the atmosphere & climate, and public perceptions.
The European Commission's Energy Roadmap 2050 identifies gas as a critical fuel for the transformation of the energy system in the direction of lower CO_2 emissions and more renewable energy. Shale gas may contribute to this transformation.
Shale gas is – by definition – a natural gas found trapped in shale, a fine grained sedimentary rock composed of mud. There are several concerns related to shale gas exploration and production, many of them being associated with hydraulic fracturing operations that are performed to stimulate gas flow in the shales. Potential risks and concerns include for example the fate of chemical compounds in the used hydraulic fracturing and drilling fluids and their potential impact on shallow ground water. The fracturing process may also induce small magnitude earthquakes which may raise public concern if felt at the surface. There is also an ongoing debate on greenhouse gas emissions of shale gas (CO_2 and methane) and its energy efficiency compared to other energy sources
There is a strong need of a better European knowledge base on shale gas operations and their environmental impact particularly, if shale gas shall play a role in Europe's energy mix in the coming decennia. M4ShaleGas' main goal is to build such a knowledge base, including an inventory of best practices that minimize risks and impacts of shale gas exploration and production in Europe.
The M4ShaleGas project is carried out by 18 European research institutions and is coordinated by TNO-Netherlands Organization for Applied Scientific Research.

Executive Report Summary

The report presents data on public perceptions of shale gas in four EU Member States: Poland, the UK, Germany and the Netherlands. Data were collected from surveys, opinion polls as well as from websites and statements of industry associations, environmental NGOs, citizens' associations, academic and think tank experts, governments and political parties. The report also provides data from the EU-level collected through Eurobarometer surveys and a on-line consultation survey conducted by the European Commission.

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1 INTRODUCTION

1.1 Context of M4ShaleGas

Shale gas source rocks are widely distributed around the world and many countries have now started to investigate their shale gas potential. Shale gas has already proved to be a game changer in the U.S. and Canadian energy markets (EIA 2015[1]). The European Commission's Energy Roadmap 2050 identifies gas as a critical energy source for the transformation of the energy system to a system with lower CO_2 emissions that combines gas with increasing contributions of renewable energy and increasing energy efficiency. It may be argued that in Europe, natural gas replacing coal and oil will contribute to emissions reduction on the short and medium terms.

There are, however, several concerns related to shale gas exploration and production, many of them being associated with hydraulic fracturing operations. There is also a debate on the greenhouse gas emissions of shale gas (CO_2 and methane) and its energy efficiency compared to other energy sources. Questions are raised about the specific environmental footprint of shale gas in Europe as a whole as well as in individual Member States. Shale gas basins are unevenly distributed among the European Member States and are not restricted within national borders which makes close cooperation between the involved Member States essential. There is relatively little knowledge on the footprint in regions with a variety of geological and geopolitical settings as are present in Europe. Concerns and risks are clustered in the following four areas: subsurface, surface, climate & atmosphere, and public perceptions. As the European continent is densely populated, it is most certainly of vital importance to include both technical risks and risks as perceived by the public.

Accordingly, Europe has a strong need for a comprehensive knowledge base on potential environmental, societal and economic consequences of shale gas exploration and exploitation. Knowledge needs to be science-based, needs to be developed by research institutes with a strong track record in shale gas studies, and needs to cover the different attitudes and approaches to shale gas exploration and exploitation in Europe. The M4ShaleGas project is seeking to provide such a scientific knowledge base, integrating the scientific outcome of 18 research institutes across Europe. It addresses the issues raised in the Horizon 2020 call LCE 16 – 2014 on *Understanding, preventing and mitigating the potential environmental risks and impacts of shale gas exploration and exploitation.*

[1] EIA (2015). Annual Energy Outlook 2015 with projections to 2040. U.S. Energy Information Administration (*www.eia.gov*).

1.2 Study objectives for this report

The report presents a review of public perceptions of shale gas in four European countries: Poland, the UK, Germany and the Netherlands. The four countries were selected for three main reasons: availability of shale gas resources, at least a temporary activity of companies drilling or test drilling for shale gas and access to information on public perceptions by the project team. The four selected countries also represent two distinct attitudes which governments adopted to fracking by either allowing exploratory drillings or banning and putting heavy restrictions on them. The Polish and UK governments openly support development of shale gas which makes it possible to analyze how public perceptions are shaped when governments give the green light to the industry and when drilling physically takes place on the ground. In Germany the government applied a cautionary principle with regard to shale gas development and put a moratorium on fracking allowing it only for scientific purposes, while in the Netherlands, after some years of experimentation, the government put a ban on fracking. Germany and the Netherlands thus constitute cases where environmental concerns are reflected in governmental decisions.

1.3 Aims of this report

The report aims at providing data on public perceptions of shale gas in four countries: Poland, the UK, Germany and the Netherlands. It is structured as follows. In the first part, literature on public perceptions of shale gas and on social aspects of shale gas development in Europe is reviewed. The following section presents country level data on public attitudes available through opinion polls and survey studies. In the next part positions of main stakeholders (industry, environmental NGO's and citizens' associations, experts, governments and political parties) are examined. This is followed by a review of communication activities on shale gas in Poland, the UK, Germany and the Netherlands. Last sections analyze EU-level data on public attitudes, such as: consultation of the European Commission on shale gas and results of the Eurobarometer study on shale gas. Conclusions provide a summary of the main findings and point to particular trends in the studied countries.

2 LITERATURE REVIEW ON PUBLIC PERCEPTIONS OF SHALE GAS

2.1 Introduction

In recent years natural gas from unconventional sources like shale gas and the method used for its extraction – high volume hydraulic fracturing (HVHF, popularly called "fracking") – increasingly became a focus of attention of the general European public. The debate develops around various issues, among which there are environmental and technological risks associated with HVHF (e.g. The Royal Society and The Royal Academy of Engineering 2012[2]) as well as the economic viability of shale gas extraction in Europe (McGlade et al. 2012; Tagliaferri et al. 2015; Bădileanu et al. 2015). At the same time, despite a growing involvement of various citizens' groups in the shale gas debate, social research on public attitudes is still relatively poor. Public perception of shale gas and HVHF and social mobilization around common concerns in Europe has not yet attracted significant academic attention. Most of the public perception studies are done in the UK, fewer take Poland as a case study. The majority of publications is based on media analysis (Schirrmeister 2014; Yang 2015; Upham et al. 2014; Jaspar et al. 2014; Jaspar and Nerlich 2013; Mazur et al. 2014). There are few studies based on focus group interviews, interviews and participant observation (Chung 2012; Parkhill et al. 2013; Cotton et al. 2014; Cotton 2015; Williams et al. 2015; TNS BMRB 2014; Lis and Stankiewicz forthcoming) and even fewer that seek to address wider questions of risk governance (Lis and Stankiewicz, upcoming), policy shift (Metze 2014) and the possibility of a wider socio-technical transition (Upham et al. 2014, Materka 2012a; Materka 2012b). In the UK, we can also find a series of public surveys carried out by the University of Nottingham, tracking awareness of and attitudes towards shale gas fracking since 2012 (O'Hara et al, 2012; 2013a and 2013b).

In the following section we provide an overview of the existing publications that deal with public perception and social acceptance of shale gas and fracking in four exemplary EU member states: Poland, the UK, Germany and the Netherlands. The reason for focusing on these four European states is twofold. On the one hand, members of the research team dealing with this work package come from these four countries which allows for a deeper insight into the public and political debate surrounding HVHF. On the other hand, especially the UK and Poland, but also Germany and the Netherlands, belong to those European countries where large quantities of unconventional gas are suspected. The interest of global gas companies to extract shale gas in these countries sparked a rich debate involving various stakeholders which

[2] The Royal Society and The Royal Academy of Engineering. 2012. Shale gas extraction in the UK: a review of hydraulic fracturing http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/shale-gas/2012-06-28-Shale-gas.pdf , accessed on 24.11.2015

attracted attention of social researchers and resulted in the largest number of publications about social aspects of shale gas development.

2.1.1 Poland

The public debate about shale gas in Poland, which is the EU Member state that entered the path of shale gas development most enthusiastically, attracted some, though not much, attention of social researchers. The earliest publications focus on broad questions of legitimacy of shale gas development in Poland, the role of research and state power in the context of the post-socialist transformation (Materka 2012a, 2012b). Articles by Materka originate from observations and informal discussions gathered in October 2011 during her short follow-up visit to northern Poland. The author observes a disjuncture between the villagers' voices against shale gas and the states' narrative of resource nationalism and a push for shale gas development irrespective of environmental costs and local opposition. Another study, authored by Johnson and Boersma (2013), assesses the status of shale gas exploration in Poland and identifies possible barriers that could hinder commercial gas exploration. While public perception per se is not a focus of this paper, the authors indicate that shale gas extraction has many proponents on a policy level while public opposition is barely visible. According to the authors, the positive attitude might be attributed to the historically difficult relations between Poland and its major gas provider, Russia. The generally positive stance towards shale gas extraction in Poland becomes apparent in the media portrayal by Jaspal et al. (2014). The media analyses reveal a positive representation of fracking in the Polish media with a stronger focus on the geopolitical rather than social aspects of shale gas and fracking. The authors argue that this leads to a positively biased stance towards HVHF which inhibits an open and constructive public debate. The high level of social acceptance of shale gas extraction in Poland also plays a role in a paper by Uliasz-Misiak et al. (2013) that assesses the legal and environmental issues of gas exploration via hydraulic fracturing in Poland. The authors speculate that the widespread social acceptability of fracking might stem from the expectation that it will improve the social situation in Poland through revenues from the future commercial exploitation. Another publication based on media analyses, by Upham et al. (2014), compares results from Poland, the UK and Germany. It examines how media representations of shale gas in these countries are anchoring shale gas in the existing socio-technical regimes or how they propose new shifts and transformations. A study on how shale gas has been framed in Poland which uses media analysis, interviews and participant observation, is presented by Lis and Stankiewicz (forthcoming). The paper examines debates on shale gas in the media, among policy makers and in local communities. It is observed that media and policy debates are dominated by political and economic frames while local debates are dominated by risk frames. At the same time, the risk frames remain locally articulated with no impact on policy debates because policy makers, business representatives and academic experts frame local actors as incompetent and irrational, and thus prevent them from entering the shale gas debate on an equal footing.

2.1.2 The United Kingdom

The public perception and public (non-)acceptance of HVHF for shale gas in the UK is subject of various academic publications. In the rather early stages of the fracking controversy, Chung (2012) discusses the different views on shale gas extraction of the local population in Flyde, Lancashire. Chung includes findings from people arguing against and in favour of shale gas production as well as those from uninterested or uninformed people. These findings suggest that public opinion is not only shaped by the perception of risks and benefits, but is influenced also by trust in different actors and the perceived legitimacy of the decision-making process. Another publication by Jaspal and Nerlich (2013) takes a closer look at the media coverage of fracking for shale gas in the UK press, showing the changing dynamics and differing focus of media representation between spring 2011, fall 2011 and spring 2012. Since March 2012 the Nottingham team has conducted seven UK-wide surveys via YouGov which have focused on public perceptions of shale gas extraction in the UK. They have published three short reports outlining the main highlights from the surveys (O'Hara et al, 2012; 2013a and 2013b). Other publications include two briefing papers by Patrick Cox (2013, 2014) on the emerging public controversy on shale gas and hydraulic fracturing in the South Downs National Park. Especially in the latter one, he remarks that public information events do not necessarily translate into greater public knowledge about shale gas exploration through HVHF and its impact on environment and social well-being. Important aspects of the local public debate include the protection of the landscape, climate change concerns, trust issues concerning policy statements on the use of fracking, as well as the fear that allowing hydraulic fracturing in some areas will lead to widespread use of this technology. A minor mention of public perception of shale gas and fracking can be found in a synthesis report by Parkhill et al. (2013) on the public values, attitudes and acceptability concerning the UK energy system. Their findings suggest that while natural gas seems to be regarded more positively in the public than oil and coal, negative biases towards fossil fuels in general, that are seen as polluting, archaic and finite, are likely to apply to unconventional natural gas, too. In Cotton et al. (2014) the authors explore the results of stakeholder interviews and quoted statements from important policy actors with regard to shale gas production. These can be subsumed under three types of 'story-lines'. The first one deals with environmental risks and benefits associated with shale gas, the second one concerns the transition from fossil fuels to more sustainable energy systems and the third one deals with aspects like distribution of economic benefits, environmental impact and fair procedures. In a final project report, social research agency TNS BMRB[3] (2014) summarizes the findings of different public dialogues on how information on and public engagement with shale gas and oil can best be implemented. In Mazur et al. (2014), the authors detail how the controversy over fracking started to gain momentum in the United States between 2010 and 2012 inciting an international debate about this technology. The paper offers an insight into the influence films like *Gasland* have on media coverage and therefore on the general public opinion on fracking. It also offers a summary of early media representation of hydraulic fracturing in the UK. Bomberg (2015) concentrates on the

[3] Taylor Nelson Sofres' 'British Market Research Bureau'

political discourses surrounding shale gas exploration and their different agendas in favour of or against drilling activities. The discourse is shaped by different 'story-lines' that treat shale gas as either an opportunity or a threat with the latter 'story-line' arguably being more successful in the current discourse for various reasons such as including a broader spectrum of issues and a lack of trust in proponents of shale gas exploration. Cotton (2015) uses both qualitative and quantitative measures to examine different perspectives on various impacts shale gas and hydraulic fracturing can have in the UK, where the stakeholders involved are in agreement and where areas of conflict arise. He finds three typical perspectives among the various stakeholders that differ in their main focus, such as (1) distrust in fossil fuels and a favour for renewable energy, (2) shale gas as a bridge fuel and (3) concern for and legislation in the public interest. In Williams et al. (2015) the authors explain that the findings of a deliberative focus group indicate that the public concern surrounding HVHF for shale gas cannot be fully explained by the lack of knowledge or understanding. Therefore the UK governmental or policy approach which operates on the assumption that public understanding of science is lacking, is not appropriate for good policy making in the case of shale gas exploration. The latest study by Whitmarsh et al. (2015) represents the first detailed UK experimental survey of public perceptions of shale gas fracking, including analysis of the effects of different messages and the relative influence of different audience, message and contextual factors on support and risk perceptions in respect of shale gas fracking. Using an online survey (N = 1457) of the UK public, the authors find considerable ambivalence about shale gas, but also greater awareness of potential risks than benefits. As expected, prior attitudes predict how information is received, with more attitude change amongst the most ambivalent respondents.

2.1.3 Germany

Only three publications deal with problems of the social perception of shale gas in Germany. Schirrmeister (2014) takes a constructivist perspective and focuses on the impact of narratives, ideas and images of hydraulic fracturing on political decisions. The results of her discourse analysis of media publications and legislative documents reveal two dominant themes in the public and political debate on shale gas. The first one concerns the pollution of soil and water resources associated with HVHF and the second one concerns the idea of natural gas from unconventional sources as a game changer for future energy supply in Germany. A publication by Naumann et al. (2014) focuses on one of the big gas companies – ExxonMobil – and its approach to gas exploration in Europe, especially in Poland and Germany. The authors' findings show that ExxonMobil uses different strategies when dealing with gas extraction in both countries. The company finds a positive social and political environment in Poland but it quickly withdraws when gas reserves prove to be smaller than hoped for. In Germany however, ExxonMobil faces difficulties in cooperation with local municipalities and regional policy makers as fracking is a more controversial issue in Germany than in Poland. In an effort to combat these hurdles, ExxonMobil increases its communication activities to win back public support. Yang (2015) discusses campaigns against fracking and their creative use of (new) media. After a short outline of the rising criticism directed at the use of hydraulic fracturing in the United States, the author then focuses on the

formation, development and practical work of local citizens' initiatives in Germany, providing several examples of different campaigning strategies as well as various ways in which citizens organize themselves online.

2.1.4 The Netherlands

A number of studies focus on the public perception of HVHF in the Netherlands. Some of them come from the area of social studies of science and technology (STS) and apply concepts such as 'wicked problems' or 'boundary objects'. A research paper by Cuppen et al. (2013) takes a closer look at hydraulic fracturing for shale gas in the Netherlands as an exemplary case of a 'wicked problem' which involves a variety of stakeholders and scientific models. In the paper, the authors try to answer the challenging question as to whether the government should allow test drilling in the Netherlands or not on the basis of various sources of information from both scientific and non-scientific perspectives. In Metze (2014) HVHF for shale gas is presented as a 'boundary object' which engages different stakeholders in various ways. Metze describes the public and political controversy around fracking in the Netherlands as something that ultimately leads to a reframing of the fracking technology from an economic issue to a planning and environmental issue. In an earlier paper for the IPA Conference in Vienna 2013, the same author explores the development of a both political and societal controversy that started when test drilling for shale gas was permitted in the municipality of Boxtel and also argues for the case of fracking as a 'boundary object' (Metze 2013). Van der Voort et al. (2014) analyze the public opinion towards shale gas exploration in the Dutch municipality of Groningen where an increasing number of earthquakes caused by drilling activities related to conventional gas production has led to social as well as emotional impacts on local residents and to distrust against both government and gas companies. To further secure a 'social license to operate', the author argues, additional social and environmental impact assessments of shale gas extraction are needed. In a 2014 paper by the Rathenau Institute on guidelines for decision-making concerning shale gas exploration in the Netherlands, the authors critically analyze a study commissioned by the Dutch Ministry of Economic Affairs on risks and safety issues of shale gas extraction in the Netherlands (van Waes et al. 2014). They conclude that this study failes to address all of the important aspects of the public and political discourse. Verschuuren (2015) compares findings concerning the role of local government in limiting or even banning the use of HVHF in different countries: The USA, the UK and the Netherlands. While higher levels of government try to overrule governmental decisions on a more local level, the author argues that involvement of local governments and communities are an important part of dealing with the issue in a responsible manner. Dignum et al. (2015) examine values underlying public discourse on shale gas production in the Netherlands. According to their findings, both proponents and opponents of drilling for shale gas share the same substantive and procedural values. The conflict arises with regard to how these values are becoming operationalized in practices of different stakeholders.

2.1.5 Comparative studies

A broader approach to the issue of the exploration of unconventional gas sources in the EU can be found in Wyciszkiewicz et al. (2011). The report provides an overview on the then current situation in 2011 of shale gas extraction in Europe with a special focus on the debates and political decision-making processes in EU institutions as well as the public debates in some EU member states, namely Germany, France, the United Kingdom, the Netherlands, Denmark, Sweden and Norway with the last chapter dealing with the situation in Poland. Concerning the four EU member states the present text is concerned with, the report states similar findings like the aforementioned publications. According to this report, the public acceptance of shale gas exploration seemed to be very high in Poland in 2011 – a statement which is supported by the findings published by other researchers mentioned before. In comparison to Poland, other EU states are faced with a growing local opposition to the exploration of unconventional gas, as can be seen in the Netherlands as well as both in the United Kingdom and in Germany, were many NGOs and citizen's initiatives argue against the use of HVHF for shale gas exploration and show concern for negative environmental impacts.

3 REVIEW OF SURVEYS AND OPINION POLLS ON SHALE GAS IN MEMBER STATES

3.1 Introduction

This chapter reviews surveys and opinion polls on shale gas which were carried out in Poland, Germany, the UK and the Netherlands. The review aims to present and compare data on public perceptions of shale gas in those countries and also to compare surveys themselves with regard to the time of their conduct, type of institutions that commissioned them and questions that were asked. The analysis is carried out in a chronological order to enable comparison between different countries as the time passed.

3.1.1 Poland

Enthusiasm for shale gas in Europe started in Poland and it has mainly been caused by the estimates of shale gas reserves by the U.S. Energy Information Agency which pointed at Poland as the future European shale gas Eldorado. First exploration licenses in Poland were issued already in 2007 and Polish political elites put shale gas high on the political agenda. Along with the first operations on the ground, came the interest in public attitude to shale gas.

In September 2011, the Centre for Opinion Polls in Warsaw presented the first report[4] from a survey study on public attitudes to shale gas. The study showed a high level of support for shale gas exploration activities - 73% in favour and only 4% against it (23% had no opinion on this issue). Support was lower when people were asked about their attitude to shale gas exploration in their neighborhood - 56% in favor and 21% against it. When it comes to benefits, 80% believed that shale gas would at least partly enhance Poland's energy security and 67% believed that the price of shale gas would not be higher than the cost of buying gas from foreign suppliers. When asked about risks, 43% believed that shale gas exploration is safe for the natural environment and 42% believed that it is safe for the humans' health. Respectively, 42% and 45% did not have an opinion on these issues and 16% and 13% considered shale gas exploration to be at least unsafe.

Another report[5] based on a survey was published in Poland in January 2013. It was commissioned by the Polish state owned gas producer PGNiG and it covered 63 local governments and 14 partners of local authorities in the Pomorskie Voivodship. This study is exceptional as to the selection of respondents. In no other Member State do we find a survey on shale gas addressed to local authorities. This probably stems from the fact that most of the operations on the ground took place in Poland (around 70 wells in Poland while in the UK only one, which as stopped as it triggered an earthquake) already in 2011 and 2012. Companies had to communicate and cooperate with local

[4] CBOS, Wydobywac? Polacy o gazie lupkowym http://www.cbos.pl/SPISKOM.POL/2011/K_112_11.PDF , accessed on 2.08.2015

[5] https://obywatelekontroluja.pl/wp-content/uploads/2013/03/PBS_UMWP.pdf , accessed on 2.08.2015

authorities on regular basis. The Pomorskie region was selected because PGNiG operates there and there were 9 active license holders within its territory. Survey was carried out among local authorities because they are the main institutional mediators between companies and local communities on the ground. Representatives of local authorities and their partners were more confident about their knowledge of shale gas (respectively 32% and 36% positive) than respondents representative of the Pomorskie voivodship (10% positive) and of Poland (7% positive). The survey showed almost total support for shale gas exploration by local authorities (97%) and their partners (100%). At the same time, the surveyed authorities expressed limited concern about the impact of shale gas exploration on natural environment (21% local authorities and 14% their partners) and a high level of trust in the license holders' performance (61% and 71%). There was also a commonly expressed hope for a greater income to feed in local budgets (97%) for development of small and medium enterprises locally (51%). A drop in the value of land and immobility were the two greatest potential losses identified by the surveyed stakeholders (69%).

In September 2013, TNS in Warsaw prepared a report[6] for the Ministry of Environment titled *Knowledge, opinions and people's needs with regard to shale gas*. The survey was carried out within the project run by the Ministry of Environment called Together about shale gas. It involved inhabitants of the Northern Poland (Voivodships: Pomorskie, Kujawsko-Pomorskie, Warmińsko-Mazurskie) and Lubelszczyzna (Lubelskie Voivodship). In both regions almost everyone knew about shale gas (92%). The vast majority supported shale gas exploration (72%) and only 7% were against it. However, when asked to evaluate their knowledge, 50% of the respondents said that it was very limited and 57% declared that they knew what shale exploration technology is.

The December 2013 survey by Millward Brown SMG/KRC commissioned by the Polish Geological Institute (Stasik, Stankiewicz 2013) revealed that one third of the respondents wanted more information about shale gas. Only 23% knew which institutions in Poland are responsible for environmental protection by regulating shale gas exploration and exploitation. In the studied regions, shale gas was perceived as being more environmentally friendly than hard coal, lignite or oil. More than half (58%) thought that shale gas was safe for the natural environment and one third (29%) thought that it was not safe. Among the possible threats, people mentioned mostly: environmental damage, water pollution, induced seismicity and explosions. The majority thought that shale gas would enhance Poland's independence from foreign gas supplies, and thus Poland's energy security (86%). Fewer people were of the opinion that shale gas would bring about lower energy prices and or that it would boost the Polish economy.

[6] http://www.mos.gov.pl/g2/big/2013_10/368d16bb149ec6d3ef53e6f7eb873567.pdf , accessed on 2.08.2015

3.1.2 The United Kingdom

In 2013, we get the first opinion polls from the UK. Two were reported by the Guardian.[7] The first national ICM survey commissioned by the Guardian found that four in 10 people would welcome hydraulic fracturing in their area, but as many would oppose it. About a fifth of voters are undecided. Women (34%) tended to be less in favour of fracking than men (55%). More than a third of people aged 18-24 opposed fracking, compared with a quarter of over-65s. Young people also tended to know more about it – only 19% were undecided, compared with 28% of pensioners. Among Tory voters, Cameron's fracking plans enjoyed substantial support, with 58% in favour nationally and only 23% against. Opposition hardened when voters were asked about fracking in their area. Only 54% would support such plans, with the number against it rising to 31%. The second Observer Poll reported by the Guardian in 2013 again revealed strong public opposition to fracking, with resistance particularly strong among women. When asked if they would like to see various alternative types of energy projects in their area, 60% of people said they would be happy to have windfarms or turbines. By contrast, only 23% were happy for fracking to take place in their area. While views were split fairly evenly among men, with 38% against fracking and 32% in favour, among women the proportion was 51% against and 15% in favour. The UK poll conducted by Panelbase and reported in the Guardian in 2014 asked about the opinion about the government's plan to change trespass laws to prevent people blocking fracking underneath their own land. Over 70% of UK people disagree with the law change, with only 17% being in favour of it. Even among those expressing their support for fracking, 62% disagreed with removing the ability to block fracking under one's own home.

Since 2012, the Department of Energy and Climate Change (hereafter DECC) carried out a series of Public Attitude surveys about various energy issues. Unfortunately, we cannot obtain data of the Wave 2 Public Attitude Tracker from July 2012 where questions about shale gas were first asked.

In April 2013, DECC published its findings from the Wave 5 Public Attitude Tracker[8] where it asked about shale gas for the second time. It showed that aawareness, at any level, of hydraulic fracturing, or 'fracking', to extract shale gas rose by ten percentage points to 52% since Wave 2 - the first time the question was asked.[9]

[7] Guardian Poll. 2013. Reported by Fiona Harvey in the Guardian. http://www.theguardian.com/environment/2013/aug/13/fracking-splits-public-opinion-icm-poll , accessed on 21.11.2015
and Opinium / Observer Poll, reported in the Guardian, 2013. http://www.theguardian.com/environment/2013/aug/24/lib-dems-damage-fracking-shale-gas-revolution , accessed on 21.11.2015

[8] DECC, Public Attitude Tracker Wave 5 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/198722/Summary_of_Wave_5_findings_of_Public_Attitudes_Tracker.pdf , accessed on 21.11.2015

[9] Unfortunately, we could not get access to the Wave 2 Public Attitude Tracker.

In February 2014, DECC published a summary report from the Wave 8 Public Attitude Tracker[10] where questions about shale gas were asked for the third time. DECC found out that more than half of people (52%) had heard of shale gas and knew what it was, a significant increase since July 2012 (32%), when the question was first asked. 27% of people said they support shale gas extraction, with half (48%) saying they neither support nor oppose it. One in five (21%) were opposed.
In April 2014, DECC published summary findings from the Wave 9 Public Attitude Tracker.[11] According to DECC, three quarters of the public (75%) were to some degree aware of hydraulic fracturing for shale gas (fracking) in March 2014 (when the survey was carried out), a significant increase since April 2013 (52%) and July 2012 (42%), when the question was first asked. In March 2014, three in ten people (29%) supported the extraction of shale gas to generate the UK's heat and electricity. In March 2014, the proportion of people who took a neutral stance on the issue was 44%. A fifth were opposed to shale gas extraction in March 2014 (22%).
In June 2014, DECC published summary findings from the Wave 10 Public Attitude Tracker.[12] The results showed that three quarters of people had some awareness of shale gas (74%), which is comparable to levels of awareness reported in March 2014. A quarter of people (24%) said that they supported shale gas extraction, which was a decline since the previous Waves (29% in March 2014). Almost half (47%) said that they neither supported nor opposed it, and a quarter were opposed (24%).
In September 2014, DECC published summary findings from the Wave 11 of the Public Attitudes tracker.[13] At that time, three quarters of people had some awareness of shale gas (76%), which is similar to that reported in June 2014 (74%). Again, a quarter of people (26%) said they supported shale gas extraction which was comparable to the most recent wave (24% in June 2014) but down slightly from March 2014 (29%). Almost half (45%) said that they neither supported nor opposed it, and there was a slight increase in opposition (27%) up from 24% in June 2014.
In March 2015, DECC repeated its Public Attitude Tracker (Wave 13) with questions on shale gas.[14] In March 72% were to some degree aware of hydraulic fracturing for shale gas (fracking) in, which is largely stable with March 2014 (75%) but markedly higher than when the question was first introduced in July 2012 (42%). In March 2015, nearly

10 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277080/summary_wave_8_findings_decc_public_attitudes_tracker.pdf , accessed on 21.11.2015

11 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/306898/summary_of_key_findings_wave_9.pdf , accessed on 21.11.2015

12 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/342426/Wave_10_findings_of_DECC_Public_Attitudes_Tracker_FINAL.pdf , accessed on 21.10.2015

13 https://www.google.com/url?url=https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/369848/Summary_of_Wave_11_findings_of_DECC_Public_Attitudes_Tracker.pdf&rct=j&frm=1&q=&esrc=s&sa=U&ei=SRePVOirPIfsaI-TgZAD&ved=0CBQQFjAA&usg=AFQjCNEh6 , accessed on 21.10.2015

14 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/424507/PAT_summary_wave_13.pdf , accessed on 21.10.2015

a quarter of respondents (24%) supported or strongly supported the extraction of shale gas to generate the UK's heat and electricity, compared to 29% in March 2014. This proportion is generally equivalent to those who oppose or strongly oppose (26% in March 2015, and 22% in March 2014). However the largest proportion of respondents remains undecided. Combined, nearly half of respondents neither support or oppose shale (44%) or don't know (5%), which is unchanged from March 2014.).

According to DECC's Wave 14 of the Public Attitude Tracker[15] published in August 2015, three quarters of the public were aware of fracking at wave 14 (75%). Awareness of fracking has remained stable over the last 18 months, following a significant increase between wave 2 (42%) and wave 8 (70%). However, only 14% claimed to know a lot about it, compared to 42% saying they knew a little. Just under one in five (19%) were aware of it but didn't really know what it was. When asked whether they support or oppose extracting shale gas, almost half of the public neither supported nor opposed it (46%). Amongst those that did offer an opinion, slightly more opposed (28%) extraction of shale than supported it (21%).

In November 2015, DECC published Wave 15 of its Public Attitude Tracker[16] which reports on the survey carried out in September 2015. In September 2015 over half of respondents (56%) reported knowing a lot or a little (14% and 42% respectively) about shale. Just over one in five (21%) reported being aware of it but not really knowing what it was. When asked whether they support or oppose extracting shale gas, just over four in ten of the public neither supported nor opposed it (43%). Amongst those that did offer an opinion, slightly more opposed (30%) this approach than supported it (23%). This is similar to the findings at wave 14.

In 2014, the results of an Industry-backed poll, reported by Emily Gosden in the Telegraph,[17] contradicted findings from the DECC polls, and suggested that less than a quarter of the public now supported shale gas extraction. During the same year, the Scottish Carbon Capture and Storage Research Centre (SCCS) concluded that carbon capture and storage was struggling to be heard amidst growing public debate over fracking.[18] According to the study, awareness of carbon capture and storage (CCS) technology remains 'persistently low' amongst the British public whereas knowledge of fracking is high and growing, according to a recent survey conducted by Cambridge University on behalf of the UK CCS Research Centre. As awareness of fracking grows by leaps and bounds, the survey found that opposition has increased relative to last year (from 26% to 34%), but so too has support increased (from 24% to 31%) as more people take sides in the shale gas debate. By contrast, support for using CCS with coal-fired electricity generation dropped from 41% in 2013 to 28% this year. Less than 2% of

15 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/450674/PAT_Summary_Wave_14.pdf , accessed on 21.10.2015

16 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/474170/Wave_15_Summary_of_Key_Findings.pdf , accessed on 21.10.2015

17 http://www.telegraph.co.uk/earth/energy/11028321/Support-for-fracking-has-declined-to-24-per-cent-energy-department-finds.html , accessed on 21.10.2015

18 http://www.sccs.org.uk/news/2014/09/06/carbon-capture-and-storage-struggling-to-be-heard-amidst-growing-public-debate-over-fracking-new-uk-study-finds , accessed on 21.10.2015

the British public could name any aspect of the CCS demo projects. In 2014 ,a YouGov poll carried out for Talk Fracking suggested that UK youth does not support shale gas.[19] Young people in the UK voted shale gas as the energy source they are least in favour of, with 71% agreeing that it will create environmental problems in the UK if it were to go ahead, including endangering wildlife and natural habitats. A 2014 study by Whitmarsh et al.[20] based on interviews and an online experimental survey pointed out that risks outweigh benefits of shale gas. Shale gas was the most unfavourable of the technologies, followed by nuclear. Doubts were expressed about the government's ability to adequately regulate shale gas.

In January 2015, a Sunday Times/YouGov poll[21] was conducted. That survey showed that 35% of people support fracking, with 41% against it. Also in 2015, a survey carried out by the ComRes polling company—commissioned by Greenpeace—showed that more people support fracking (42%) than oppose it (35%). Men almost twice as likely as women (56% vs 29%) to be in favour, with support highest amongst people aged 65+. Nearly a third (31%) of voters said they would be less likely to vote for candidates who backed fracking. Also in 2015, Carbon Brief published a survey of what the UK public thinks about climate change and energy.[22] It found that more people oppose fracking for shale gas than support it. Furthermore, awareness of the process of fracking for shale gas has grown. In the same year, the Abundance Poll[23] was carried out which listed activities that people believed involvement in is unethical. There is a subset of four activities that between two fifths and one third of people say involvement with would make a company unethical. They are: tobacco (43%), zero hours contracts (42%), fracking (36%) and GM foods (33%).

In 2015, Carbon Brief also reported data from Dods Energy Preference Briefing[24] on what politicians think about their constituents' views on wind versus shale gas. The most striking partisan difference appeared when the MPs were asked about which energy source they thought their constituents preferred. Broadly speaking, Conservatives MPs expected their constituents to prefer shale gas, while Labour MPs expected a preference for wind power. Dods asked MPs whether their constituents would prefer wind, solar, nuclear or shale sites within two miles of their home. The MPs then ranked the technologies in order of what they thought they constituents would

[19] http://www.talkfracking.org/news/uk-youth-give-government-the-big-thumbs-down-on-fracking/

[20] http://psych.cf.ac.uk/understandingrisk/reports/Shale%20&%20CCS%20Interim%20Report%20WORKING%20PAPER.pdf , accessed on 21.10.2015

[21] http://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/gjshgtgjrm/YG-Archive-Pol-Sunday-Times-results-300115.pdf , accessed on 21.10.2015

[22] http://www.carbonbrief.org/blog/2015/04/what-the-uk-public-thinks-about-climate-change-and-energy-in-seven-charts/?utm_source=Weekly+Carbon+Briefing&utm_campaign=70b817606f-Carbon_Brief_Weekly_230415&utm_medium=email&utm_term=0_3ff5ea836a-70b817606f-30343 , accessed on 21.10.2015

[23] http://docs.abundancegeneration.com/Abundance%20Consequences%20GBMS%20Report%20June%202015.pdf , accessed on 21.10.2015

[24] http://www.carbonbrief.org/blog/2015/01/survey-shows-partisan-split-among-mps-on-climate-and-energy/?utm_source=Daily+Carbon+Briefing&utm_campaign=4a740d0109-cb_daily&utm_medium=email&utm_term=0_876aab4fd7-4a740d0109-303421221 , accessed on 21.10.2015

prefer. Some 60 per cent of the Conservative MPs ranked shale gas either first or second. A majority of MPs from all the other parties ranked it third. In contrast, 90 per cent of Labour MPs ranked wind power first or second. Less than a third of Conservative MPs did likewise.
In October 2015, the lastest report from the Nottingham Polls was published.[25] The 11th University of Nottingham Survey was conducted between September 23rd and 28th 2015 which found that there has been a significant drop in the level of support for shale gas extraction in the UK over the last year, with overall approval standing at +10.4% compared with +21% in September 2014 and +39.5% in July 2013 - immediately before the Balcombe protests.

3.1.3 Germany

In February 2013, the first opinion poll on shale gas carried out in Germany can be identified. It was carried out by the Institute for Social Research and Statistical Analysis (Forsa) and commissioned by the Association of Municipal Companies (*Verband kommunaler Unternehmen e.V., VKU*). It was a representative survey for Germany. Two questions were asked: Have you heard about "shale gas" and "fracking" before? Half of the respondents answered 'yes' (49%) and half answered 'no' (51%). The second question asked: Should shale gas extraction be regulated very strictly or not that strictly, to make good use of this alternative energy source? Most of the respondents were in favor of strict regulations (79%) and only 14% wanted 'not too strict regulations'. Interestingly, only in this German survey and in one UK survey[26] carried out in 2014, do we find questions about regulations.
Between March and April 2013, a German NGO Campact commissioned a short poll by TNS Emnid. The poll asked whether fracking should be allowed in Germany and the results revealed that the vast majority was against it (66%) and only one quarter supported it (23%). The group of the undecided respondents was small (10%).
Another poll was carried out in Germany in 2013 by the YouGov organization (November). The results showed that 49% think the moratorium on fracking is good, 26% think that fracking should be prohibited in the future and 9% think that it should be allowed. Quite a large group of the undecided people (16%) has been identified as well. The majority (68%) prioritized environmental protection and 18% prioritized independent energy supply. Almost half (48%) think that they know what fracking is and 20% know the term "fracking" but don't know what it refers to. One third (33%) has never heard of the term yet. In 2014, there was still a strong interest in public opinion in the four studied countries.

25 http://bettersociety.net/images/Public%20Perceptions%20of%20shale%20gas%20in%20the%20UK%20sept131015MH.WK.JA-H.pdf , accessed on 21.10.2015

26 Poll conducted by Panelbase and reported in the Guardian, 2014. http://www.theguardian.com/environment/2014/sep/04/ban-fracking-from-national-parks-say-majority-of-uk-public?utm_medium=email&dm_i=UP4,2S19F,EV45XU,A3WZ9,1&utm_source=UKERC&utm_campaign=4667235_Energy%20News%20Update%2005%20September%202014 , accessed on 21.10.2015

We can find two pragmatically-oriented surveys in Germany.[27] The survey for the PREISVERGLEICH.de, asked: Would you be indifferent to the fact that the gas for your heater or your stove got extracted via fracking? The majority (79%) answered no, they would not be indifferent about it, while 21% would be indifferent about it. Over a third (37,6%) replied that with a lower gas price, they would use gas extracted via fracking for cooking and heating and over a half (62,4%) replied that they would choose a "fracking free" gas tariff if it were offered, even though they would not be saving money on the gas price.
A survey carried out for the German Industry Association for Oil and Gas Producers (WEG) showed that 79% agreed with the statement that natural gas and oil will be needed for the foreseeable future, to ensure safe and affordable energy services. Concerns about the use of fracking were diverse: 25% deemed it dangerous for the environment, 13% harmful to (ground) water, 11% thought that long-term consequences were not foreseeable, 10% pointed to general dangers/risks, 9% were afraid of the use of chemicals and toxic materials, 6% saw the risk of landslides, subsidence and earth tremors, 4% pointed to the risks of the technology, while 33% had no concerns.
In April 2015 Infratest Dimap conducted a poll on behalf of Abgeordnetenwatch. More than half of the people (61%) asked for a complete ban of fracking. More than one forth (27%) said no to a complete ban and more than one tenth (12%) did not care or were undecided about it. The interviewees are all over 18 and therefore eligible to vote. Regardless of which political party the interviewees supported, most of them still are in favor of a ban on fracking. Supporters of the Green party: 87% pro ban, 13% against (complete) ban. Supporters of the Left: 75% pro ban, 14% against (complete) ban. Supporters of the SPD: 68% pro ban, 26% against (complete) ban. Supporters of the AfD: 64% pro ban, 35 against (complete) ban. Supporters of CDU/CSU: 58% pro ban, 31 against (complete) ban.
Another poll was conducted in 2015 by Insa on behalf of TLZ (Thüringische Landeszeitung), the national newspaper of the federal state Thuringia. Results showed that 60% were of the opinion that fracking should be prohibited in general, 19% said that fracking was reasonable and 21% were not decided. People over 55 were more in favor of a prohibition of fracking than people under 25, more people are in favor of a prohibition regardless of which political party they vote for. In favour of a ban fracking are: 82% of people voting for the Greens, 74% of people voting for the Left, 53% of people voting for either SPD, CDU/CSU or FDP.
Also in 2015, there was another poll conducted by YouGov showing that 12% approved of the use of fracking when extraction oil or gas, 20% were neutral and 56% were opposed. When asked about the most important aspects of fracking they pointed to protection of the environment (72%) and independence in energy supply (16%). Most of the people thought that fracking us unsafe (67%) and only 17% thought that it is safe.

[27] keyfacts Onlineforschung GmbH on behalf of: PREISVERGLEICH.de, 2014 and forsa on behalf of: WEG (German Industry Association for Oil and Gas Producers.

3.1.4 The Netherlands

All the Dutch opinion polls identified by us were carried out in 2013. It is difficult to conclude about the attitude of the Dutch society towards shale gas extraction since the four opinion polls identified show very different results. The poll reported by De Telegraf[28] showed that two thirds had no objections against test drilling and that the majority thought that shale gas extraction in the Netherlands should take place. Interestingly, 64% did not disapprove of having shale gas extraction in their backyard but 31% would object to that. The main reasons in favor of fracking were the following: decreased energy prices, competitive advantages for the Dutch economy, greater independence from energy imports from Russia and the Middle East and general economic and geopolitical benefits which outweighed potential effects of shale gas on the environment. Another survey from 2013 that was carried out by pollster Maurice the Hond[29] through the website Peil.nl showed that almost half of the respondents were against fracking (44%) and only one third was in favor of fracking (35%). Another poll carried out by Dutch gas company ENECO revealed that a quarter of the participants thinks shale gas extraction should be prohibited in the Netherlands and only 16% are in favor of shale gas extraction. An opinion poll commissioned by the Ministry of Economic Affairsin 2013 shows that 80% of the public is against shale gas extraction in the Netherlands.[30] However, the Aardgas-update (Natural gas Update), an initiative of industry stakeholder NOGEPA, found in 2013 that 81% thought that the Netherlands needed to conduct exploratory drilling for shale gas, while only 19% opposed that idea. However, only 35% said that the Netherlands should extract shale gas and 65% were against it.

[28] Arnoud van Waes http://sargasso.nl/publieke-opinie-over-schaliegas-onduidelijk/ ; original source: http://www.telegraaf.nl/watuzegt/wuz_stelling/21316943/__We_moeten_schaliegas_winnen__.html Accessed on 27.10.2015. The survey was conducted by BCO, the internal research department of Telegraph Media group where “De Telegraf” is published , accessed on 21.10.2015

[29] http://www.energieoverheid.nl/2013/05/07/maurice-de-hond-merendeel-nederlanders-tegen-schaliegasboringen/ , accessed on 21.10.2015

[30] Report by Vera Brouns (Commissioner of Governmental Affairs), https://www.cda.nl/noord-brabant/boxtel-liempde/actueel/toon/schaliegas/ , accessed on 21.10.2015

4 REVIEW OF STAKEHOLDERS' POSITIONS ON SHALE GAS

4.1 Introduction

Another important part of our research included assessment of the positions on HVHF for shale gas of several types of stakeholders, such as industry associations, NGOs especially related to the environmental sector, associations of citizens who are either directly affected by drilling activities or show concern over shale gas exploration in general, as well as the opinions of think tank and academic experts. The position of governmental actors and political parties as well as the laws and regulations that currently are in place, were also an aspect of our research. In this section we aim to provide a broad description of the various positions of these main groups of stakeholders, again concentrating on the situation in the four exemplary EU member states Poland, the United Kingdom, Germany and the Netherlands. How these diverse groups of stakeholders and their varying positions on the matter at hand have an impact on the governmental decision making process and vice versa is beyond the scope of this paper. While it seems to be obvious that these different stakeholders do have an influence on political decision making and on the general stance that different political parties take towards HVHF, the mechanisms that lie behind it, as well as the various degrees of stakeholder influence, are not easily brought to light and should be subject to further research activities.

4.1.1 Poland

4.1.1.1 Industry associations

Polskie Górnictwo Naftowe i Gazownictwo S.A. (from now on PGNiG) is the Polish state-owned oil&gas company. The company has 10 licenses for shale gas exploration.[31] The company runs its own information and communication campaign for local communities and for training local administration.[32] During its local activities, PGNiG also meets with representatives of NGOs. The company runs a website[33] with information about its licenses, activities, legislative changes in Poland and latest news on shale gas from Poland and abroad. It also offers calculations of benefits coming from taxes to local communities.[34] In its assessment of benefits, PGNiG refers to a report[35] by the Kosciuszko Institute from Krakow that was one of the first reports in Poland on the

[31] Lupki Polskie http://www.lupkipolskie.pl/lupki-w-polsce/koncesje-pgnig/mapa-koncesji , accessed 20.10. 2015
[32] Lupki Polskie http://www.lupkipolskie.pl/lupki-w-polsce/dialog-spoleczny , accessed 20.10. 2015
[33] Lupki Polskie www.lupkipolskie.pl , accessed 20.10.2015
[34] Lupki Polskie http://www.lupkipolskie.pl/korzysci/dla-gminy-i-jej-mieszkancow , accessed 20.10. 2015
[35] Albrycht, I. (2013) Analiza infrastruktury gazowej w Polsce z perspektywy przyszlych wyzwan energetycznych i rozwoju sektora gazu niekonwensjonalnego. Instytut Kosciuszki, Krakow http://www.opppw.pl/files/1484621376/file/raport_ik.pdf , accessed 24.11.2015

benefits of shale gas production in the U.S. and on the impact of the U.S. shale gas production on local communities.

Representatives of PGNiG tend to use the argument that drilling for shale gas is safe since thousands of drills made by the company in a conventional way during the last half of the century did not bring any harm or damage.[36] Experts from PGNiG often state 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."[37] This is not true but differences become apparent only when the PGNiG experts are asked to elaborate on their arguments. The Vice-President of the board of 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."[38] 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."[39]

The Association of the Polish Oil&Gas Upstream Industry (Organizacja Polskiego Przemysłu Poszukiwawczo-Wydobywczego, OPPPW) was established in June 2010 and includes several companies: BNK Polska Sp. z o.o. which was established by the BNK Petroleum Inc., CalEnergy Resources Poland Sp. z o.o. which belongs to Grupy CalEnergy Resources, Chevron, ConocoPhillips, Cuadrilla, Grupa Lotos, ORLEN Upstream, PGNiG, San Leon Energy, ShaleTech Energy. The association represents interests of national and international companies and it works as a platform for the exchange of knowledge between different companies. It sees shale gas as a chance for Poland.[40] On its website, OPPPW states that "shale gas is the same thing as natural gas"[41] where it elaborates on technological differences for its exploration which contribute to naming it 'unconventional gas'. It also underlines the potential role of shale gas for securing supplies of gas to Poland a couple of decades. In its mission statement it presents itself as a forum for exchanging knowledge on shale gas and as a body which wants to support the Polish government in regulating exploration of the unconventional hydrocarbons.[42] It does not popularize expertise on risks of HVHF on its website but rather facts related to the characteristics of companies' activities, such as

[36] PGNiG o łupkach: "W przypadku jakichkolwiek zniszczeń, naprawiamy je zaraz". (2013). Portal Samorządowy, http://www.portalsamorzadowy.pl/komunikacja-spoleczna/pgnig-o-lupkach-w-przypadku-jakichkolwiek-zniszczen-naprawiamy-je-zaraz,54410.html , accessed 18.11.2013

[37] Local meeting in the Pomerania Region, Jan. 2013

[38] PAP. (2011). Karabuła: potrafimy bezpiecznie i ekonomicznie wydobywać gaz z łupków, Bankier.pl, 29.09.2011, http://www.bankier.pl/wiadomosc/Karabula-potrafimy-bezpiecznie-i-ekonomicznie-wydobywac-gaz-z-lupkow-2414358.html , accessed 29.01.2014.

[39] Public meeting in Przywidz, March 2012

[40] OPPPW http://docplayer.pl/7374661-Gaz-lupkowy-szansa-dla-polski.html , accessed on 25.11.2015

[41] OPPPW http://www.opppw.pl/pl/gaz-z-lupkow/17 , accesses on 25.11.2015

[42] OPPPW http://www.opppw.pl/pl/wizja_i_cele/3 , accessed on 25.11.2015

the number of wells, assessment of available shale gas resources. On its website, it states that if safety standards of drilling are met, shale gas extraction is safe.[43]

4.1.1.2 Environmental NGOs and citizens' associations

There are a number of NGOs opposed to fracking in Poland. Most of them are active at a local level. The biggest international NGOs like Greenpeace and WWF did not mark their strong involvement in the debate on shale gas. Greenpeace in Poland is actively campaigning against the planned nuclear power plant and it allocated little time and resources to anti-fracking campaigns. However, Greenpeace was one of the environmental NGOs which was accused in Poland (also in the Czech Republic) of taking money from Gazprom to campaign against shale gas. As a response to these accusations, in May 2011, Greenpeace issues a statement[44] on its website saying that the organization does not take money from companies and government. It also states that gas, in general, is considered by Greenpeace as a transition fuel which can help to accomplish the energy transformation. In the statement, Greenpeace also referred to the U.S. negative experience with shale gas exploration and urged the Polish government to abandon the shale gas project and invest in renewable energy and energy efficiency. Polish media reported more about Greenpeace's activities in Romania rather than in Poland.[45]

The WWF has not been much visible in the anti-fracking campaigns. Friends of the Earth in Poland are represented by the Polish Ecological Club (Polski Klub Ekologiczny, PKE), which is the oldest Polish ecological organization dating back to the 1980s. The PKE has not taken part in the anti-fracking activities. A statement about shale gas has been issued by a network of NGOs involved in climate action called Climate Coalition (*Koalicja Klimatyczna*, *KK*),[46] which concluded that shale gas is not a solution for climate change as it does not address the problem of deeper cuts in carbon dioxide emissions in Poland. The statement pointed that shale gas is more dangerous to environment than conventional gas, and thus it should be regulated with greater care. The coalition demanded public access to data about sources of water supply for fracking and monitoring of water and soil. It also urged to apply new methods for capturing methane emissions (so called green completion). At the same time, if the above stated conditions were met and the government declared a clear strategy for reducing the use of coal through shale gas exploitation, the Coalition could see shale gas as a transitional fuel to low carbon economy in Poland.

[43] OPPPW http://www.opppw.pl/pl/szczelinowanie_hydrauliczne/22 , accessed on 25.11.2015
[44] Greenpeace Polska http://www.greenpeace.org/poland/pl/wydarzenia/polska/ekolodzy-nie-do-kupienia/ , accessed on 12.11.2015
[45] Polska Radio http://www.polskieradio.pl/42/3167/Artykul/1171331,Greenpeace-blokuje-poszukiwania-gazu-lupkowego-w-Rumunii , accessed on 26.11.2015; Forbes http://www.forbes.pl/greenpeace-chce-zablokowac-poszukiwania-gazu-lupkowego-w-rumunii,artykuly,179408,1,1.html , accessed on 26.11.2015
[46] Koalicja Klimatyczna http://www.koalicjaklimatyczna.org/lang/pl/page/gaz_lupkowy/id/108/ , accessed on 12.09.2015

It may be important to note that actual drilling and hydraulic fracturing activities have been taking place in Poland since 2010. There is an initiative called Citizens Control[47] (*Obywatele Kontroluja*) that was established on October 1st 2012 by the Institute of Citizens' Affairs (*Instytut Spraw Obywatelskich, INSPRO*) in cooperation with the Centre for Sustainable Development (*Centrum Zrownowazonego Rozwoju*) from Lodz, Green Federation – Krakow Group (Federacja Zielonych – Grupa Krakowska) and Food & Water Watch Europe. The purpose of the initiative was to monitor companies drilling for shale gas in Poland. At the end of the project, in 2014, a report from the monitoring was published "Shale Gas as a Challenge for Democracy: Report from Monitoring"[48] ("Gaz Lupkowy Wyzwanie dla Demokracji: Raport z Monitoringu"). A second report "Citizens Control – a Handbook of fighting communities"[49] („Obywatele Kontrolują – poradnik walczących społeczności") is a manual for local communities that are faced with shale gas exploration in their neighbourhoods. The report outlines legal procedures that can be utilized by the communities as well as different communication and mobilization strategies. The team cooperated closely with local communities as well as with Green MEPs in Brussels and Strasburg. They supported protests in Zurawlow in Southern-Eastern Poland by organizing lectures about shale gas and meetings with experts.

There are two main areas where local protests took place. In the North, most of the opposition came in the Kaszuby Region, close to the Baltic coast, and in the South the most famous and long lasting protest took place in Zurawlow, close to the Ukrainian border. When the opposition mobilized, citizens established protest groups and citizens organizations. There have also been many contacts established with international organizations and MEPs, in Kaszuby in particular with Food&Water Watch Europe based in Brussels and with No Fracking France and in Zurawlow with the French Green MEP Jose Bove, German MEPs and with people protesting in Balcombe in the UK. In 2014, activists from Zurawlow and from Kaszuby made a trip to Brussels at the invitation of the Green Alliance to take part in a conference on fracking. There they met protesters from Balcombe as well as from other places in the UK, Romania and Bulgaria.

There are also local organizations such the Association of Niesiołowice - Węsiory - "Kamienne Kręgi" run in Kaszuby by a local leader Hieronim Wiecek. He has been cooperating with the Brussels based organization Food&Water Watch Europe and he has been present at almost all public events on shale gas in the Kaszuby area and in Gdansk. There have also been many organizations which ceased to exist, like Złupieni.pl, which demanded:

"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

[47] Obywatele Kontroluja https://obywatelekontroluja.pl/ , accessed on 12.09.2015
[48] Obywatele Kontroluja https://obywatelekontroluja.pl/wp-content/uploads/2014/11/Raport-roboczy-31.01.2014.pdf , accessed on 12.09.2015
[49] Obywatele Kontroluja https://obywatelekontroluja.pl/obywatele-kontroluja-poradnik-walczacych-spolecznosci/ , accessed on 12.09.2015

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"[50]

4.1.1.3 Academic and think tank experts

There is a number of experts, institutes and think tanks involved in the debate on shale gas in Poland. The central role of a knowledge producing institution has been played by the Polish Geological Institute (*Panstwowy Instytut Geologiczny, PIG*) which conducted several studies on the environmental impact of shale gas exploration, including fracking. Some studies reviewed the existing literature and regulations and some analyzed data collected at the drilling sites. The most famous study was carried out at the drilling site called Lebien,[51] where PIG carried out an assessment of environmental impact of hydraulic fracturing. The PIG has also actively supported local authorities in communication on shale gas with local inhabitants. They adopted a rule of taking invitations to local meetings only from public authorities. They have been rejecting offers from companies and from local citizens groups. The PIG runs its own information website.[52] The other central institute in this area is the Institute of Oil and Gas (*Instytut Nafty i Gazu, ING*) which has been involved in research on fracking. At a meeting of the Committee of Geological Sciences of the Polish Academy of Sciences on 11 December 2013, the committee issued a statement[53] saying that the main task of the Polish government with regard to shale gas was to provide conditions to assess the volume of this resource by companies and by the geological services.

Several think tanks have discussed, provided consulting services and published on shale gas. The Kosciuszko Institute from Krakow ran a project "Unconventional Gas – chance for Poland and Europe?"[54] (*Gaz niekonwencjonalny – szansa dla Polski i Europy?*) and published a report with the same title. It organized a number of conferences and conference panels on shale gas and organized screening of the movie FrackNation in different places in Poland. A liberal think tank DemosEuropa, which is associated with the Civic Platform, has also published short briefs commenting on prospects for shale gas in Poland. In June 2015, in cooperation with the Warsaw Institute for Energy Studies and the Fridtjof Nansen Institute, it published a White Book on Management of Natural Resources in Poland.[55] However, in this report, shale gas exploration is mentioned only as a context for management of natural resources in Poland and there are no recommendations that would specifically relate to extraction of unconventional fossil fuels. The most important think tank that provided almost all foreign companies

[50] A written statement presented during public hearing in Gdańsk, October 1st, 2013.
[51] Panstwowy Instytut Geologiczny http://www.pgi.gov.pl/pl/dokumenty-in-edycja/doc_download/786-the-ebie-report , accessed on 12.09.2015
[52] Panstwowy Instytut Geologiczny http://infolupki.pgi.gov.pl/ , accessed on 3.11.2015
[53] Stanowisko Prezydium Polskiej Akademii Nauk, 11.03.2014 https://forumakademickie.pl/media/content/news/stanowisko_w_sprawie_gazu_%C5%82upkowego.pdf , accessed on 3.11.2015
[54] Instytut Kosciuszki http://ik.org.pl/pl/projekt/nr/5047/gaz-niekonwencjonalny-szansa-dla-polski-i-europy/ , accessed on 3.11.2015
[55] Blusz, K. et al. (2015) Obywatele zasobni w zasoby. Biala Ksiega zarzadzania zasobami naturalnymi w Polsce. Warsaw: Demos Europa http://zasobni.pl/wp-content/uploads/2015/06/demos_2951_zasoby_FINAL.pdf , accessed on 3.11.2015

with expertise on the regulatory, economic and social environments of shale gas projects is the Institute of Energy Studies[56] in Warsaw (*Instytut Studiow Energetycznych, ISE*). This institute has also run a program Gas for the Community[57] (*Gaz dla Gminy*) within which it provides advice and training for local authorities about shale gas. All think tanks in Poland have supported shale gas exploration. Differences between their positions refer to different visions of the legislative order regulating this sector and to different visions of shale gas in the total energy mix.
Also many scientists from universities have got involved in research and communication on shale gas. Among many, the most active ones are the Gdansk Technical University (in the North) and the Krakow Technical University (in the South). In 2012 the government launched a ten years long program to support development of technologies for shale gas exploration suitable for the Polish geological conditions, called Blue Gas.[58] Within it, the government financed a big consortium of several institutions (PGNiG, PIG, ING, Gdansk Technical University and the Krakow Technical University) who jointly carry out technical research. The think tank and scientific community in Poland has been positive and enthusiastic about the prospect of having unconventional oil and gas in Poland. They have been enthusiastic for many reasons, hoping to secure domestic supplies of gas for Poland, but also hoping for new scientific discoveries and for the possibility to assess gas resources.

4.1.1.4 The government and political parties

The political scene in Poland has changed after elections in October 2015. The conservative Law and Justice party (PiS) gained the enough votes to create the government without any coalition partner. Until 2015, the government was formed by the coalition of the liberal Civic Platform party (PO) and the Polish Peoples Party (PSL) which has its main electorate in the land. However, the change of the government will not bring about change in Poland's position towards shale gas development. All major political parties are in favour of shale gas exploration and development. Only during a short period of time, in 2012, the party led by Janusz Palikot was against shale gas and supported local communities in their protests.[59] The party which has devoted most energy and time for supporting local communities against shale gas is the Green Party[60] (*Partia Zieloni*). However, this party did not enter the Parliament in the 2015 elections. The Polish government formed by the ruling coalition of PO and PSL was a strong proponent of shale gas development in Poland. The licensing process started in 2007 and to date the government has awarded over 100 licenses to Polish and foreign companies. The Ministry of Environment grants licenses, while the Ministry of

[56] Instytut Studiow Energetycznych http://www.ise.com.pl/ , accessed on 3.11.2015
[57] Instytut Studiow Energetycznych http://www.ise.com.pl/gaz-z-lupkow , accessed on 3.11.2015
[58] Narodowe Centrum Badan i Rozwoju http://www.ncbir.pl/programy-krajowe/wspolne-przedsiewziecia/blue-gas---polski-gaz-lupkowy/ , accessed on 3.11.2015
[59] Reczpospolita http://www4.rp.pl/artykul/927601-Palikot-przeciw-polskim-lupkom.html , accessed on 3.11.2015; Na Temat http://natemat.pl/28473,ruch-palikota-idzie-na-wojne-z-polskimi-lupkami-mieszkancy-prosili-nas-o-pomoc , accessed 3 Nov 2015 ; http://media.wm.pl/?tag=janusz-palikot , accessed on 3.11. 2015
[60] Partia Zieloni http://partiazieloni.pl/ , accessed on 3.11.2015

Treasury overlooks upstream investments of state-owned companies' and regulates the taxation of hydrocarbons in Poland. However, the government did not create a position in the government which would coordinate the government's activities with relation to shale gas, as it did for the nuclear project. In the newly elected Parliament, PiS established a new Ministry of Energy which will take over responsibilities of the Ministry of Economy in the area of energy and will take the responsibilities of the Ministry of Treasury with regard to ownership supervision of the state-owned mining companies. The government will also appoint the government's plenipotentiary (coordinator) for the strategic energy infrastructure.[61]

Looking back in time, one can find greatest enthusiasm for shale gas in Poland in 2010. At that time, the framing of 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 a boost for the Polish economy. 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."[62] In 2010 there were many hopes that the shale gas business would be profitable for everyone - for the companies, for the Polish economy and advantageous for the energy security of Poland. A change in the debate came in 2011 when the 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 at those sites. The media discovered that companies could easily fake the fulfilment of their license-related obligations.[63] Around those events, in the second half of 2011, the government set out to prepare a special law to regulate taxation on shale gas exploration (and other hydrocarbons) and to amend the Geological and Mining Law.

In October 2012, the government presented 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 exploring 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.[64] The major change proposed at that time was to establish a new body called the National Operator of Energy Minerals NOKE (Narodowy Operator Kopalin Energetycznych).[65] The 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

[61] WNP http://www.wnp.pl/wiadomosci/262190.html%7D , accessed on 25.11.2015
[62] Gazeta Wyborcza, 27 January 2010, Wednesday
[63] Mazurczak, M. (2014). Bez NOKE polski sektor łupkowy to europejskie Eldorado. Łupki Polskie, http://gazlupkowy.pl/bez-noke-polski-sektor-lupkowy-to-europejskie-eldorado/ , accessed on 10.09. 2015
[64] Malinowski, D. (2013). Gaz łupkowy okiem chemicznego potentata, WNP.PL http://gazownictwo.wnp.pl/gaz-lupkowy-okiem-chemicznego-potentata,206835_1_0_1.html , accessed on 29.01.2014
[65] Malinowski, D. (2012). Po co w gazie łupkowym Narodowy Operator Kopalin Energetycznych? WNP, http://gazownictwo.wnp.pl/po-co-w-gazie-lupkowym-narodowyoperator-kopalin-energetycznych,181697_1_0_0.html , accessed on 10.09.2015

between investors and the Ministry of Environment. The NOKE's participation in the application for an exploitation permit would not be mandatory but would depend on a company's individual decision.[66] 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.

Proposed regulations did not address environmental and technological risks. They focused on securing state control over shale gas exploration and production. 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 an environmental perspective and would pre-empt additional environmental regulations at the EU level. In November 2013, the Minister of Environment said that the: "blocking shale gas exploitation by additional EU-level regulations would be disastrous for Poland."[67] 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. 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."[68] The Prime Minister empathized with the companies' concerns. He turned to the Polish Minister of Environment 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."[69]

At the end of 2013, the then in place Minister of Environment was dismissed and a new one was appointed with the objective to conclude the work on shale gas regulations.[70] 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.[71] A retreat from this idea was promoted mainly by the new Minister of Environment who instead proposed to strengthen the role of the Higher

[66] Mazurczak, M. (2014). Bez NOKE polski sektor łupkowy to europejskie Eldorado. Łupki Polskie, http://gazlupkowy.pl/bez-noke-polski-sektor-lupkowy-to-europejskie-eldorado/ , accessed on 4.03. 2014

[67] Korolec: łupki powinny być pod kontrolą Ministerstwa Środowiska, (2013). FORBES, http://www.forbes.pl/korolec-sektorem-lupkowym-powinno-zarzadzac-ministerstwosrodowiska,artykuly,166465,1,1.html , accessed on 4.03.2014

[68] Kublik, A. (2013). Kto opóźnia łupki?, Gazeta Wyborcza, 24 May 2013

[69] Kublik, A. (2013). Kto opóźnia łupki?, Gazeta Wyborcza, 24 May 2013

[70] Chmal: rząd słusznie zrezygnował z NOKE. (2014). Łupki Polskie, http://gazlupkowy.pl/chmal-rzad-slusznie-zrezygnowal-z-noke/ accessed on 4.03.2014

[71] Sawicki, B. (2014a). Coraz mniej zainteresowanych łupkowymi koncesjami. Łupki Polskie http://gazlupkowy.pl/coraz-mniej-zainteresowanych-lupkowymi-koncesjami/ accessed on 4.03.2014

Mining Office over unconventional hydrocarbons.[72] Some even commented that "no NOKE" meant the end of a dream about "Polish shale" and, as one expert said "without NOKE the Polish shale gas sector is a European Eldorado."[73]
To sum up, there were two main legal acts that were changed by the previous government. Amendments to the Geological and Mining Law[74] and the Law on the Extraction and Taxation of Hydrocarbons and regarding Hydrocarbons' Fund were proposed by the Ministry of Environment.[75] The second act was prepared in cooperation with the Ministry of Finance. On August 1st, 2014, the then President signed the amended Geological and Mining Law and on August 25th, 2014, the then President signed the Law on Special Taxation on Taxation of Hydrocarbons.[76] Today, there are still several companies operating on their licenses, but only Polish companies are conducting new drilling work. The new government which came to power in November 2015 will certainly try to revive the project of shale gas development in Poland. We can expect some changes in the legal framework and some new ideas about how licenses are allocated to companies. However, two major obstacles to developing a shale gas industry in Poland need to be overcome. One is a technical issue, Polish shale needs new technologies of fracking; and the other issue is economic, the price of oil and gas are currently too low to make shale gas exploration in Poland economically profitable. On October 29th 2015, Poland and China signed a memorandum about cooperation between their geological services in the area of geological research and mining.[77] Poland and China count on the advancement of technologies for shale gas exploitation.

4.1.2 The United Kingdom

4.1.2.1 Industry associations

The UK Onshore Operators Group (UKOOG) represents the onshore oil and gas industry—both conventional and unconventional and is for obviously in favour of shale gas development. It states that: 'we represent the onshore oil and gas industry, enhance the profile of the whole onshore industry (both conventional and unconventional); promote better and more open dialogue with key stakeholders; deliver industry wide initiatives and programmes; and ensure the highest possible standards in safety,

[72] Rząd rezygnuje z koncepcji powołania NOKE. (2014). Puls Biznesu, http://www.pb.pl/3547827,74653,rzad-rezygnuje-z-koncepcji-powolania-noke , accessed on 4.03.2014
[73] Mazurczak, M. (2014). Bez NOKE polski sektor łupkowy to europejskie Eldorado. Łupki Polskie http://gazlupkowy.pl/bez-noke-polski-sektor-lupkowy-to-europejskie-eldorado/ , accessed on 4.03.2014
[74] Rzadowe Centrum Legislacji http://legislacja.rcl.gov.pl/lista/2/projekt/141245 , accessed on 5.11.2015
[75] Ministerstwo Srodowiska http://www.mos.gov.pl/artykul/7_archiwum/19317_projekt_zalozen_do_ustawy_weglowodorowej_uzgodniony.html , accessed on 5.11.2015
[76] http://infolupki.pgi.gov.pl/pl/prawo-koncesje/gospodarka/opodatkowanie-weglowodorow-nie-takie-wysokie-nie-wplynie-negatywnie-na , accessed on 5.11.2015
[77] http://gazownictwo.wnp.pl/polsko-chinska-umowa-o-wspolpracy-ws-lupkow-podpisana,260308_1_0_0.html , accessed on 5.11.2015

environment management and operations.'[78] Similarly to the Polish oil&gas company PGNiG, the Group underlines that it builds upon a long history of drilling in the UK and a long experience in safe drilling in sensitive areas.[79] One of UKOOG's arguments pro shale gas is that gas cannot be replaced in the UK's energy mix by renewables overnight.[80] It sees lower emissions compared to coal, LNG and pipeline as a benefit for the environment and £100,000 payment to local communities, plus a share of future revenues, as a benefit to communities.[81]

4.1.2.2 Environmental NGOs and citizens' associations

The Royal Society for the Protection of Birds (RSPB) has actively worked against shale gas. On its website it states and justifies its opposition against fracking where it states that the regulatory framework for the industry does not provide sufficient protection for the natural environment. And government has not put forward a convincing case that demonstrates that shale gas extraction will not undermine the UK's ability to meet its legally binding climate change targets or its broader commitment to keeping global climate change to within 'safe limits'. [82] It published a policy brief in August 2013 "Shale gas in the UK" where it said: "Shale gas operations pose risks for water quality, nature and climate change. The impacts on the environment are poorly understood but potentially significant, and yet the Government is determined to put its weight and support behind it. We are concerned that developing unconventional gas resources including shale gas is incompatible with the UK's commitments on climate change. Furthermore, the current environmental regulatory framework may not provide adequate protection for the environment, especially as regulators are under pressure to speed up permitting processes."[83] In March 2014, RSPB published a report "Hydraulic fracturing for shale gas in the UK: Examining the evidence for potential environmental impacts."[84] In the report, the authors refer to the U.S. experience and point out that "Given the potential to cause significant, and in some cases irreversible, environmental damage, eg accidental spills, it is vital that the Government's planning authorities and regulators adopt a precautionary approach to high-volume hydraulic fracturing for shale gas in the UK." The report addressed the following issues: groundwater vulnerability, polluting potential of fracking fluid, water usage, analysis of water resource impacts in England and Wales, flowback water management, blowouts, induced seismicity, well decommissioning. It also presented a study on the potential impacts of shale gas

[78] http://www.mineralproducts.org/documents/MPA_Wales_Conference_2015_Ken_Cronin.pdf , accessed on 5.11.2015
[79] http://documents.hants.gov.uk/planning-strategic/oil-gas-event/OilGasEventSpeaker6-UKOOGforweb.pdf , accessed on 5.11.2015
[80] http://documents.hants.gov.uk/planning-strategic/oil-gas-event/OilGasEventSpeaker6-UKOOGforweb.pdf , accessed on 5.11.2015
[81] http://documents.hants.gov.uk/planning-strategic/oil-gas-event/OilGasEventSpeaker6-UKOOGforweb.pdf , accessed on 5.11.2015
[82] http://www.rspb.org.uk/forprofessionals/policy/climatechange/action/ukenergy/shalegas.aspx https://www.rspb.org.uk/Images/fracking_summary_tcm9-354139.pdf , accessed on 5.11.2015
[83] https://www.rspb.org.uk/Images/Shale_gas_in_the_UK_RSPB_full_policy_briefing_tcm9-351566.pdf , accessed on 5.11.2015
[84] https://www.rspb.org.uk/Images/shale_gas_report_evidence_tcm9-365779.pdf , accessed on 5.11.2015

development on the population of pink-footed geese in and around the Ribble and Alt. RSPB also supported shale gas protests in West Sussex (Balcombe). The RSPB has also run a shale gas fracking project with the objectives to review literature of the environmental risks associated with exploration, extraction and decommissioning of shale gas facilities, map areas of shale gas resource and areas of ecological/water/landscape sensitivity, identify areas of key concern in the UK where fracking is likely to have the highest risk of causing ecological damage and/or water shortages/water pollution, produce a report to support casework and advocacy.[85] A partnership of the Angling Trust, the National Trust, the Royal Society for the Protection of Birds (RSPB), the Salmon & Trout Association, The Wildlife Trusts and the Wildfowl & Wetlands Trust (WWT) wrote policy recommendations for a robust regulatory framework for the shale gas industry in the UK "Are we fit to frack?"[86] which states: "We believe commercial shale gas extraction should only go ahead in the UK if it can be objectively demonstrated that the regulatory framework for the industry is fit for purpose, and offers sufficient protection to the natural and historic environment."[87]

Greenpeace is also openly opposing fracking for shale gas. On its website it gives four reasons "why we could all be fracked by fracking" which are the following: exacerbation of climate change, damages in the countryside, massive usage of water, no prospects for lowering energy prices.[88] Greenpeace's fracking advert that claimed drilling for shale gas won't cut energy bills' was banned by watchdog.[89] It also undermined the claim that shale gas could bring more jobs in the UK.[90] Friends of the Earth UK is another organization strongly opposing fracking in the UK. On its website it states that "controversial shale gas exploration has come to the UK."[91] It also accuses the UK government that it supports shale gas industry despite The UK Government has given the green light despite: mounting community opposition, overhyped economic benefits - fracking in the UK is unlikely to lower fuel bills, contributions towards dangerous climate change, links to drinking water contamination in USA and Australia and calls for a stop to fracking.[92] They also provided an information hub to provide a means of sharing information, ideas and support for local, regional and national campaigning.[93] Friends of the Earth Scotland has also run a project against shale gas

[85] http://www.rspb.org.uk/whatwedo/projects/details.aspx?id=363857#objectives , accessed on 5.11.2015
[86] https://www.rspb.org.uk/Images/shale_gas_summary_tcm9-365778.pdf , accessed on 5.11.2015
[87] http://www.rspb.org.uk/Images/shale_gas_summary_tcm9-365778.pdf , accessed on 5.11.2015
[88] http://www.ukoog.org.uk/ , accessed on 5.11.2015
[89] http://www.dailymail.co.uk/news/article-3069500/Greenpeace-fracking-advert-claimed-drilling-shale-gas-won-t-cut-energy-bills-banned-watchdog.html , accessed on 5.11.2015
[90] http://www.greenpeace.org.uk/blog/climate/industry-claims-shale-gas-will-bring-jobs-lancashire-just-more-hot-air-20150619 , accessed on 5.11.2015
[91] Friends of the Earth UK https://www.foe.co.uk/campaigns/climate/issues/fracking_background_information_33157 , accessed on 5.11.2015
[92] Friends of the Earth UK https://www.foe.co.uk/campaigns/climate/issues/fracking_background_information_33157 , accessed on 5.11.2015
[93] Friends of the Earth UK http://www.foe.co.uk/campaignhubs/index.php/page,page2160.html , accessed on 5.11.2015

and fracking[94] and a blog.[95] Apart from the environmental concerns, Friends of the Earth also raised a concern that shale gas exploration will not enhance UK's energy security.[96]

There is a relatively large number of associations of citizens across the UK. They have been established to fight fracking and to oppose shale gas exploration and extraction. Some have a regional or country level outreach. The anti-fracking NGOS include Frack Off[97] and the Extreme Energy Action Network.[98] The organization Frack Free Wales[99] resists unconventional fossil fuel extraction in Wales. There is also a celebrity driven anti-fracking group calling for a proper debate about fracking called Talk Fracking.[100] Another group is called No dash for gas - Reclaim the Power and it is taking direct action on environmental, economic and social justice issues, working in solidarity with affected communities.[101] In August 2013, Reclaim the Power held a mass action camp at Balcombe, Sussex in solidarity with the local community fighting Cuadrilla's plans to frack in the area.[102] In several locations in the UK, groups were formed to oppose drilling for shale gas: Balcombe[103], Vale of Glamorgan[104], Llantrithyd Villagers Against Drilling[105], Lancashire (Frack Free Lancashire)[106]. Additionally, there are cultural and religious groups which took the anti-fracking agenda on board. Diocese of Blackburn[107] believes that there is a Christian duty to be "stewards of the earth" (Kirkup, 2013). Also the 'Green Anglicans' are involved in anti-fracking campaign[108]. There are also pagan movements united against fracking, such as the Warrior's Call: Pagans United Against Fracking[109].

4.1.2.3 Academic and think tank experts

There are various experts, of various backgrounds, who shape the debate on shale gas in the UK. Climate change experts include Kevin Anderson[110] and John Broderick[111], one

[94] Friends of the Earth Schotland http://www.foe-scotland.org.uk/fracking , accessed on 5.11.2015
[95] Friends of the Earth Schotland http://www.blog.foe-scotland.org.uk/ , accessed on 5.11.2015
[96] http://drillordrop.com/2015/05/22/going-all-out-of-shale-wont-cut-gas-imports-says-friends-of-the-earth/
[97] Frack-Off UK http://frack-off.org.uk/ , accessed on 5.11.2015
[98] Extreme Energy http://extremeenergy.org/about/eei-people-2/ , accessed on 5.11.2015
[99] Frack Free Wales http://www.frackfreewales.org/ , accessed on 6.11.2015
[100] Talk Fracking http://www.talkfracking.org/ , accessed on 6.11.2015
[101] No Dash for Gas http://www.nodashforgas.org.uk/ , accessed on 6.11.2015
[102] No Dash for Gas http://www.nodashforgas.org.uk/who-we-are/ , accessed on 6.11.2015
[103] Frack Free Balcombe http://www.frackfreebalcombe.co.uk/page27.php , accessed on 6.11.2015
[104] Say NO to Toxic Gas Drilling in the Vale https://www.facebook.com/thevalesaysno , accessed on 6.11.2015
[105] Llantrithyd 'Villagers Against Drilling' http://www.llantrithyd.com/ , accessed on 6.11.2015
[106] Frack Free Lancashire http://frackfreelancashire.org.uk/cms/ , accessed on 6.11.2015
[107] Anglican Church http://www.blackburn.anglican.org/more_info.asp?current_id=469 , accessed on 6.11.2015
[108] Green Anglicans, Official Blog of the Anglican Communion Environmental Network https://carbonfast2013.wordpress.com/2013/05/14/with-love-for-god-and-concern-about-frackingan-appeal-to-engage-in-local-discussion-around-hydraulic-fracturing-in-many-parts-of-the-anglican-communion/ , accessed on 6.11.2015
[109] http://www.warriorscall.org/ , accessed on 6.11.2015
[110] http://www.manchester.ac.uk/research/kevin.anderson/ , accessed on 6.11.2015

of their main claims is that shale gas in the UK is incompatible with the climate change goals.[112] In November 2011, both co-authored a report by the Tyndall Centre for Climate Research titled "Shale gas: an updated assessment of environmental and climate change impacts."[113] The report concludes that in an energy hungry world, any new fossil fuel resource will only lead to additional carbon emissions. In the case of shale gas there is also a significant risk its use will delay the introduction of renewable energy alternatives. "Consequently, if we are serious in our commitment to avoid dangerous climate change, the only safe place for shale gas remains in the ground" says Professor Kevin Anderson at the Tyndall Centre and the University of Manchester.[114] Human rights experts include Damian Short from the University College London.[115] He focuses on the violation of civil and political rights by the shale gas industry.[116] He is also one of the founders of the Extreme Energy Initiative.[117] Economics and politics experts include Michael Bradshaw[118] from the Warwick Business School. In one of his texts, he suggested that gas could play an important role as a 'bridging fuel' to a low-carbon economy, but warns that it won't be long before gas becomes part of the problem rather than the solution.[119] Geology experts include Rob Ward[120] (BGS, Head of Groundwater Science) has expertise on ground water resources[121] and is an advisor to the Task Force on Shale Gas.[122] Law experts include James Taylor who also serves as an advisor to the Task Force on Shale Gas.[123]

The initiative Talk Fracking[124], funded by Humanade with donations from Vivienne Westwood, Joseph Corre and Lush, takes a closer look at the relations between academics and the shale gas industry. They named the experts involved in industry "frackademics" and issued a report analyzing this involvement.[125] The report aimes at understanding the environment which shapes the debate on shale gas in the UK and to

[111] http://www.mace.manchester.ac.uk/people/staff/profile/?ea=john.broderick , accessed on 6.11.2015

[112] http://kevinanderson.info/blog/uk-international-commitments-on-climate-change-are-incompatible-with-the-development-of-a-national-shale-gas-industry/ ; http://kevinanderson.info/blog/why-a-uk-shale-gas-industry-is-incompatible-with-the-2c-framing-of-dangerous-climate-change/, accessed on 6.11.2015; http://www.tyndall.ac.uk/shalegasreport , accessed on 6.11.2015

[113] http://www.tyndall.ac.uk/sites/default/files/coop_shale_gas_report_update_v3.10.pdf , accessed on 6.11.2015

[114] http://www.tyndall.ac.uk/shalegasreport , accessed on 6.11.2015

[115] http://research.sas.ac.uk/search/staff/113/dr-damien-short/ , accessed on 6.11.2015

[116] http://www.theecologist.org/News/news_analysis/2615102/fracking_is_driving_uk_civil_and_political_rights_violations.html , accessed on 6.11.2015

[117] http://extremeenergy.org/about/eei-people-2/ , accessed on 6.11.2015

[118] http://www.wbs.ac.uk/about/person/michael-bradshaw , accessed on 6.11.2015

[119] http://www.wbs.ac.uk/news/gas-can-be-a-bridge-to-a-low-carbon-future-say-ukerc/ , accessed on 6.11.2015

[120] http://www.bgs.ac.uk/staff/profiles/2000.html , accessed on 6.11.2015

[121] http://www.bgs.ac.uk/research/groundwater/shaleGas/home.html ; http://www.bgs.ac.uk/research/energy/shaleGas/environmentalImpacts.html , accessed on 6.11.2015

[122] https://www.taskforceonshalegas.uk/our-advisors , accessed on 6.11.2015

[123] https://www.taskforceonshalegas.uk/our-advisors , accessed on 6.11.2015

[124] Talk Fracking http://www.talkfracking.org/about/ , accessed on 24.11.2015

[125] Frackademics Report (2015) Talk Fracking http://www.talkfracking.org/frackademics/frackademics-report/ , accessed on 24.11.2015

trace potential mechanisms by which the public opinion is being manipulated.[126] The report concludes based on six case studies that "given the inertia within academia, and the fact that decisions on resource allocation today may result in long-standing commitments to research in certain fields rather than others, it is questionable whether NERC can justify supporting research which champions the discovery and extraction of fossil fuels."[127] Moreover, it accuses the government of basing its policy "on statements which, in light of recent research on the environmental impacts of unconventional gas and oil, are arguably unsound."[128] The report is also critical about the Mackay-Stone report on climate impacts of shale gas as it uses arguably unrepresentative data to construct a case for the climate-friendly status of shale gas."[129] The Science Media Centre created to promote science among the public was accused of "creating a false certainty about the safety of these processes, and thus mislead the public about the impacts that may result if development took place in Britain."[130] 'The Guardian letter' is presented in the report as a prime example of misleading the public opinion by providing inaccurate data or "exaggerations of the statistical evidence available."[131]Finally, the report denounces the Task Force on Shale Gas as an independent and impartial organization to represent the public interest, since "the members of the Task Force previously expressed positions in support of shale gas development, the organisation behind the Task Force is similar to that of other industry-dominated groups – such as the All Party Parliamentary Group on Unconventional Gas and Oil."[132]

4.1.2.4 The government and political parties

The UK government supports shale gas exploration. "The government believes that shale gas has the potential to provide the UK with greater energy security, growth and jobs. We are encouraging safe and environmentally sound exploration to determine this potential."[133] While the Conservative Party won a majority in the May 2015 elections with a manifesto commitment to develop a shale gas industry in the UK, the Labour

[126] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-report/#introduction , accessed on 26.11.2015
[127] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[128] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[129] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[130] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[131] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[132] "Frackademics" – A study of the relationships between academia, the fossil fuels industry and public agencies http://www.talkfracking.org/frackademics/frackademics-conclusion/ , accessed on 26.11.2015
[133] https://www.gov.uk/government/publications/2010-to-2015-government-policy-energy-industry-and-infrastructure-licensing-and-regulation/2010-to-2015-government-policy-energy-industry-and-infrastructure-licensing-and-regulation#appendix-7-developing-shale-gas-and-oil-in-the-uk , accessed on 5.11.2015

Party called for tightening shale gas rules.[134] Also some of the Green MPs, in particular Caroline Lucas, leader of the Green Party of England and Wales, supported the call for a moratorium on shale gas and condemned a report from the Energy and Climate Change Committee which concluded there was no need for a moratorium.[135] Caroline Luces also supported anti-shale gas activists in Balcombe. Recenty, there has been a change in the Government's tone from hype and going all out for shale to supporting a programme of exploration. A Moratorium for fracking was called in Scotland in January 2015, while further research and public consultation is carried out.[136] In February 2015, the Welsh Government voted to impose a moratorium on fracking in Wales. However, the Welsh Government is unable to inforce this because shale gas licensing is controlled by Westminster. The policy response to fracking in Wales is still unclear.[137]At the same time, the Report of the British Geological Service shows that there is limited potential of shale gas in Wales.[138] As to the licencing process, the results of the 14th licensing round have not yet been fulling announced.

However, looking back in times, despite showing a clear interest in developing shale gas in the UK, the British government adopted a cautious attitude to hydraulic fracturing. In May 2011, the House of Commons, Energy and Climate Select Committee published a Shale Gas report[139] which concludes that shale gas in the UK is it is likely to be a 'game changer.' But when in the same time Spring Cuadrilla's activities triggered two minor seismic events, the Government responded by imposing a moratorium on further drilling in June 2011. In December 2012, the UK Government lifted the moratorium on shale gas drilling with new traffic light system in place to monitor seismicity. In April 2013, the House of Commons, Energy and Climate Change Committee published a report *The Impact of Shale Gas on Energy Markets*[140] where it provided cautious and qualified support for shale gas development in the UK. In June 2013, UKOOG announced the industry's Community Engagement Charter that will

[134] Pickard, J. (2014) Financial Times http://www.ft.com/cms/s/0/250e184e-7e02-11e4-87d9-00144feabdc0.html#axzz3shjtcO1T , accessed on 26.11.2015

[135] Campaign Against Climate Change http://www.campaigncc.org/frackingmeeting , accessed on 23.11.2015

[136] http://news.scotland.gov.uk/News/Moratorium-called-on-fracking-1555.aspx. However, the Scottish government's position on fracking still remains unclear: http://www.desmog.uk/2015/04/24/scottish-government-s-position-fracking-remains-unclear , accessed on 5.11.2015

[137]The Ecologist http://www.theecologist.org/News/news_round_up/2745595/fracking_company_defies_waless_shale_gas_moratorium.html Ceredigion Council was the first county to officially ban fracking in Wales, although there are no exploitable shale resources there, accessed on 5.11.2015

[138] British Geological Service (2014) A Study of Potential Unconventional Gas Resource in Wales http://gov.wales/about/cabinet/cabinetstatements/2014/unconventionalgas/?lang=en , accessed on 23.11.2015

[139] House of Commons Energy and Climate Change Committee. 2011. Shale Gas: Shale Gas: Fifth report of session 2010-12 (volume 1). House of Commons HC795. http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/795/795.pdf , accessed on 23.11.2015

[140] House of Commons, Energy and Climate Change Committee (2013) *The Impact of Shale Gas on Energy Markets* http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenergy/785/785.pdf , accessed 22.11.2015

provide £ 100,000 per well site and 1% of revenues at the production stage.[141] This proposal earned criticism. The government was accused of trying to bribe local communities to gain their support for drilling for shale gas. In November 2013, Chancellor's Autumn Statement introduced tax breaks for shale gas exploration. In May 2014, the House of Lords, Economic Affairs Committee published a report on The Economic Impact on UK Energy Policy of Shale Gas and Oil[142] where it supported the development of shale gas and asked the Government to do more.
One of important legislative achievements of the British government was the Infrastructure Act from February 2015. [143] In the Chapter 7, Part 6, on energy it introduced onshore hydraulic fracturing safeguards. The environmental impact of the development which includes the relevant well has been taken into account by the local planning authority. Appropriate arrangements have been made for the independent inspection of the integrity of the relevant well. The level of methane in the groundwater has, or will have been, monitored in the period of 12 months before the associated hydraulic fracturing begins. Appropriate arrangements have been made for monitoring of emissions of methane into the air. The associated hydraulic fracturing will not take place within other protected groundwater source areas. The associated hydraulic fracturing will not take place within other protected areas. In considering an application for the relevant planning permission, the local planning authority has (where material) taken into account the cumulative effects of—(a) that application, and (b) other applications relating to exploitation of onshore obtainable by hydraulic fracturing. The Substances used, or expected to be used, in associated hydraulic fracturing—(a) are approved, or (b) are subject to approval, by the relevant environmental regulator. In considering an application for the relevant planning permission, the local planning authority has considered whether to impose a restoration condition in relation to that development. The relevant undertaker has been consulted before grant of the relevant planning permission. The public was given notice of the application for the relevant planning permission.

4.1.3 Germany

4.1.3.1 Industry associations

In Germany the Industry Association for Oil and Gas Producers (WEG)[144] is a very influential organization that represents the interests of key players in the oil and gas

[141] www.ukoog.org.uk , accessed on 23.11.2015
[142] House of Lords Economic Affairs Committee. 2014. The Economic Impact on UK Energy Policy of Shale Gas and Oil http://www.publications.parliament.uk/pa/ld201314/ldselect/ldeconaf/172/172.pdf , accessed on 24.11.2015
[143] Infrastructure Act 2015, Chapter 7, Part 6, Energy. http://www.legislation.gov.uk/ukpga/2015/7/enacted , accessed on 22.11.2015
[144] In German: „Wirtschaftsverbund Erdöl- und Erdgasgewinnung e.V. (WEG)

industry and seeks to influence the nature of current draft laws and regulations.[145] Among its over 90 members are the international oil and gas companies ExxonMobil, Wintershall, Shell, RWE and DEA AG.[146] Obviously their position on the matter of hydraulic fracturing and shale gas exploration is very positive and they argue in favour of implementing fracking technologies in Germany claiming that natural gas will be a necessary tool for future German energy supply with natural gas from unconventional sources gaining relevance.[147] Apart from the Industry Association for Oil and Gas Producers, only one other industry association could be found that has a distinct, though much more negative, position on the use of hydraulic fracturing in Germany: The Alliance for the Protection of Water was established in 2013 and represents more than 1000 German corporations; among them the German Brewer's Association, the Association of German Mineral Water Producers and the Association of the German Non-alcoholic Beverage Industry.[148] They demand a complete prohibition on the implementation of hydraulic fracturing[149] or at the very least very strict regulations on a federal level for the protection of water and criticize heavily the draft law of the German government submitted in 2015.[150]

4.1.3.2 Environmental NGOs and citizens' associations

Naturally, many non-governmental organizations, especially those concerned with environmental issues, have taken up the topic of shale gas exploration through HVHF and try to influence policy making in a different direction than the above mentioned industry association WEG. In Germany, six NGOs with a clear position on and activities against the use of HVHF were found: Greenpeace, the Energy Watch Group (EWG), the BUND (Union for the environment and nature conservation Germany), NABU (Nature and Biodiversity Conservation Union), Campact and DUH (the German Environment Aid Association). After regularly informing people on the issue of fracking as well as shale gas and shale oil exploration on their website, Greenpeace issued a statement on hydraulic fracturing in January 2015. After a short description of the current state of shale gas exploration in Germany, the technology used to extract this unconventional gas – hydraulic fracturing – and the deniable impact natural gas from unconventional sources has on the security of the German energy supply, the author asserts that drilling for shale gas not only leaves open many questions concerning the consequences of its use, but holds many risks for both human well-being and the environment. He concludes that in light of these potential risks, Greenpeace rejects the exploitation of natural gas (and oil) from unconventional deposits and demands the consistent development of renewable energies instead.[151] The Energy Watch Group

[145] http://www.erdoel-erdgas.de/Der-WEG/Organisation, accessed on 09.10.2015
[146] http://www.erdoel-erdgas.de/Der-WEG/Mitglieder; accessed on 09.10.2015
[147] Hydraulic Fracturing – Prozess und Perspektiven in Deutschland; brochure published by WEG, accessible on their webpage
[148] Bündnis zum Schutz von Wasser – Gemeinsame Pressemitteilung, Berlin, 24. November 2014
[149] Deutscher Brauer-Bund, Pressemitteilung, Berlin, 13. Mai 2014.
[150] Deutscher Brauer-Bund, Pressemitteilung, Berlin, 8. Juni 2015
[151] Feddern, J.: *Risiken durch Fracking - Stellungnahme zur Erschließung unkonventioneller Gasvorkommen durch Hydraulic Fracturing*, January 2015

(EWG) is a not-for-profit international network of scientists and parliamentarians that "commissions projects by scientists who are working on studies independently of government and company interests".[152] These projects focus on issues surrounding the shortage of fossil and nuclear energy resources, scenarios concerning the development of renewable energy as well as deriving strategies for the long-term security and affordability of future energy supply.[153] The results of their studies and projects are available to experts, interested citizens and the general public.[154]In a study by Dr. Werner Zittel, published in 2015, the EWG presents the interim result of their research concerning the situation of shale gas exploration via hydraulic fracturing in the USA as well as in Europe with a special focus on the situation in Germany.[155] While the EWG doesn't position itself explicitly in favour or against the use of fracking technology, the study makes it clear that the EWG does not regard hydraulic fracturing as a technology with a viable future, especially when it comes to Europe and Germany. In regard to their findings, the EWG concludes it to be counterproductive and unjustified to promote fracking technology or prioritize it instead of other economic and social interests – especially since hydraulic fracturing is likely to be of very low significance for the German economy but has a high potential for conflict.[156] The BUND[157] - the Union for the Environment and Nature Conservation Germany – "is a non-profit, non-partisan, and non-confessional federal grassroots NGO with more than 480,000 members and supporters".[158] The Union is also a member of the international network Friends of the Earth and as such aims to protect the environment and is concerned with nature preservation. The position of the BUND concerning shale gas exploration and the usage of hydraulic fracturing is clear: the BUND takes a stance against the exploration and exploitation of natural gas from unconventional resources as well as the use of hydraulic fracturing - be it in (scientific) test drilling or in commercial drilling – due to the uncontrollable risks associated with this technology.[159] Following concerns about the unknown negative consequences that fracking technology might have on the general population and the environment, the BUND suggested changes to the Federal Mining Act in a 2013 paper directed at corresponding law authorities which would prohibit hydraulic fracturing in Germany.[160] In September 2015, in cooperation with other NGOs, citizen's associations and other critical organizations, the BUND released an open letter addressed to together both form the current government in Germany. In this letter the signees prompt the representatives to advocate in favour of a complete ban on the use of hydraulic fracturing in Germany and to stop relying on fossil fuels for future

[152] http://energywatchgroup.org/us/; accessed on 12.10.2015
[153] http://energywatchgroup.org/us/, accessed on 12.10.2015
[154] Ebd.
[155] Zittel, W.: *Fracking – eine Zwischenbilanz*, March 2015, Energy Watch Group, p.: 5
[156] Ebd. p.: 7
[157] In German: Bund für Umwelt und Naturschutz Deutschland (BUND) (
[158] http://www.bund.net/ueber_uns/bund_in_english/; accessed on 12.10.2015
[159] http://www.bund.net/fracking; accessed on 12.10.2015
[160] Bund für Umwelt und Naturschutz Deutschland e. V. (BUND): Vorschlag für einen Gesetzentwurf zur Aufnahme eines Verbots in das Bundesberggesetz (BBergG), Bergbau mittels des Hydraulic Fracturing (Fracking) zu betreiben; 7.May 2013

energy supply.[161] Another NGO in the environmental sector is NABU[162] – the Nature and Biodiversity Conservation Union that: "is one of the oldest and largest environment associations in Germany. The association encompasses more than 560,000 members and sponsors, who commit themselves to the conservation of threatened habitats, flora and fauna, to climate protection and energy policy." [163] In 2013 the organization published a position paper on hydraulic fracturing and shale gas exploration in Germany. In it, NABU demands a prohibition of the use of hydraulic fracturing in Germany and an adjustment of the current legal practice to include mandatory environmental impact assessments, approval of fracking projects only in compliance with technological and ecological minimum standards, no fracking in preserved water areas and a legal obligation to let the public participate in approval processes.[164] Campact is a citizen's movement with about 1.7 million registered members dedicated to progressive policy making that offers an online platform for participation and specializes in the internet-based organization of protests, campaigns and political activism concerning a variety of different topics usually in collaboration with other NGOs, amongst others for example the above mentioned BUND, but also organizations like Attac, Oxfam and LobbyControl.[165] Since 2014, Campact has run a still active campaign against the use of hydraulic fracturing in Germany. The core demand is an appeal to the Federal Government to ban the use of fracking technology in Germany completely.[166] As of the 12th October 2015, the appeal was signed by 512,564 people. Another environmental association that also sometimes collaborates with Campact is the DUH, the German Environmental Aid[167] that sees itself as a forum for environmental organizations in general as well as policy makers and economic decision-makers.[168] Their mission is to inform the public on environmental issues, but also to provide a place for dialogue between different stakeholders and to engage in transparent environmental policy making.[169] In a 2015 interview with Cornelia Nicklas, the head of Legal Affairs at the DUH, she made it clear that the DUH takes a very critical stance towards hydraulic fracturing and demands an extensive ban on the use of this technology for shale gas exploration, both in commercial as well as in test drilling. This position is based on the risks and open questions associated with hydraulic fracturing concerning public and environmental health and because shale gas exploration via fracking is seen as

[161] Bund für Umwelt und Naturschutz Deutschland e. V. (BUND): Fracking verbieten, Klima schützen, Energiewende voranbringen, Berlin, 22. September 2015, as of 12.10.2015 accessible on: http://www.bund.net/themen_und_projekte/klima_und_energie/kohle_oel_und_gas/fracking/frackingverbot/
[162] In German: Naturschutzbund Deutschland
[163] https://en.nabu.de/about/index.html, accessed on 12.10.2015
[164] Sieberg, U. et al.: NABU-Position - Gewinnung von Erdgas aus konventionellen und unkonventionellen Lagerstätten durch Fracking; 2013, Naturschutzbund Deutschland (NABU) e.V., p.6f.
[165] https://www.campact.de/campact/ueber-campact/campact-im-ueberblick/, accessed on 12.10.2015
[166] https://www.campact.de/fracking/appell-2014/teilnehmen/; accessed on: 12.10.2015
[167] In German: Deutsche Umwelthilfe
[168] http://www.duh.de/3873.html, accessed on 12.10.2015
[169] Ebd.: http://www.duh.de/3873.html, accessed on 12.10.2015

incompatible with the German energy transition program ("Energiewende") which should focus on the promotion of renewable energy sources.[170]
All these non-governmental organizations and environmental associations work in close collaboration with various citizens' initiatives that operate at a more local or regional level and argue vehemently against drilling activities and the application of hydraulic fracturing to explore for unconventional gas resources on their communal land. To recount all of those initiatives would go beyond the scope of this paper, so instead we focus on two broader organizations that serve as umbrella organizations for these initiatives. One of them is "Gegen Gasbohren" (in English: Against Gas Drilling) – an association of initiatives concerned with both conventional and unconventional gas exploration and the consequences of high volume hydraulic fracturing (HYHF) in Germany. It consists in about 65 regional citizens' initiatives located mainly in the northern and north-western part of Germany.[171] Their web presence www.gegen-gasbohren.de functions as both an information platform for the individual initiatives to provide information on their recent activities, challenges addressed and the current state of drilling activities in their region as well as an organizing tool for the activities of these initiatives, like information events or demonstrations and other protest activities. It also allows for networking with likeminded associations and NGOs. It further organizes the collection of signatures for petitions against the use of hydraulic fracturing.[172] The initiatives forming "Gegen Gasbohren" argue in favour of a strict prohibition of test drilling and commercial gas exploration through hydraulic fracturing from both unconventional as well as conventional sources. According to the so-called "Korbacher resolution", this also encompasses hydraulic fracturing measures that do without using chemicals in the frac fluid. Further demands include a general ban on importing and exporting fossil fuels derived through fracturing activities, generally prohibiting the underground storage of frac fluids, focusing on participation rights and high environmental standards when mining law is concerned and lastly a consequent commitment to the goals of the German energy transition program ("Energiewende"), meaning a shift away from fossil fuels to the development of renewable energy sources.[173] The resolution is signed by 26 initiatives against hydraulic fracturing and is supported by about 300 different organizations (NGOs, other initiatives, stakeholder associations, political organizations, municipalities and corporations).[174] A second important organization is the Federal Association of Citizens' Initiatives for Environmental Protection (BBU)[175] that acts both as an environmental association working with a team of voluntary scientists, experts and dedicated citizens and as

[170] http://www.duh.de/4008+M565786d997d.html, accessed on 12.10.2015
[171] For a quick overview on the location of the individual citizens' initiatives see: http://www.gegen-gasbohren.de/initiativen/ (accessed on 14.10.2015)
[172] An overview on current petitions and lists of signatures against fracking can be found here: http://www.gegen-gasbohren.de/aktiv-werden/petitionen-und-unterschriftenlisten/ (accessed on 14.10.2015)
[173] http://www.gegen-gasbohren.de/aktionen-forderungen-und-ziele/korbacher-resolution/ , accessed on 14.10.2015
[174] https://www.resolution-korbach.org/project/unterst-aus-de.php , accessed on: 14.10.2015
[175] In German: Bundesverband Bürgerinitiativen Umweltschutz (BBU)

umbrella organization for various citizens' initiative against hydraulic fracturing.[176] They work together with other associations and NGOs such as the above mentioned "Korbacher Resolution" or "Gegen Gasbohren" and are part of the online petition against hydraulic fracturing issued by Campact.[177] One recent example of their position and activities is a statement from January 2015 on the planned revisions of several l (e.g. the Federal Water Act, the Federal Nature Conservation Act, the Federal Mining Act and the directive environmental risk assessment for mining activities etc.) regarding the legal framework for hydraulic fracturing. In this statement, the BBU argues for a ban of hydraulic fracturing without exceptions. The statement was signed by 39 additional organizations, (regional) citizen's initiatives and stakeholder associations.[178]

4.1.3.3 Academic and think tank experts

A number of experts from various disciplines related to drilling technologies like hydraulic fracturing have voiced their opinion on the current situation of gas extraction from unconventional resources. In this section we will forego individual opinions on the topic at hand and will instead concentrate on exemplary positions of expert associations and scientific institutes. In June 2013 three German institutes – the Institute for Geosciences and Natural Resources (BGR), the Helmholtz Centre Potsdam – German Research Center for Geosciences (GFZ) and the Helmholtz Center for Environmental Research (UFZ) – organized a conference with various national and international scientists discussing the topic "Environmentally friendly Fracking?".[179] The conference resulted in a final declaration ("Hanover Declaration") in which the participants reinforced the importance of natural gas and its extraction for the State of Germany and argued that natural gas from unconventional sources like shale gas could help stabilize dwindling local gas production. Additionally, the experts stress the need for further research concerning environmentally friendly fracking technologies whose development and usage should be implemented in a transparent and participatory way with the protection of ground and drinking water as a primary priority.[180] In March 2013, the Geological Surveys of the German States (SGD) and the Federal Institute for Geosciences and Natural Resources (BGR) issued a joint statement detailing their evaluation of several studies on shale gas exploration and hydraulic fracturing – among them a report by the Federal Environmental Agency (UBA), the so-called NRW study and the final report of ExxonMobils' InfoDialogue, the "Risikostudie Fracking". The result of their research concludes the evaluated studies and their conclusions to have some weaknesses that – according to SGD and BGR - lead to an overestimation of the

[176] http://www.bbu-online.de/html/BBU-Selbstdarstellung.pdf, accessed on 14.10.2015
[177] http://www.bbu-online.de/ , accessed on 14.10.2015
[178] Bundesverband Bürgerinitiativen Umweltschutz e.V. (BBU): Stellungnahme zu den Entwürfen zur Änderung des Wasserhaushaltsgesetzes, des Bundes-Naturschutzgesetzes, der Grundwasserverordnung, des Umweltschadensgesetzes, der Verordnung über die Umweltverträglichkeitsprüfung bergbaulicher Vorhaben, der Allgemeinen Bundesbergverordnung, des Bundesberggesetzes und der Einwirkungsbereichs Bergverordnung zur Festsetzung des rechtlichen Rahmens der Fracking-Technik; 23th January 2015
[179] Original Titel in German: „Umweltverträgliches Fracking?"
[180] BGR, GFZ, UFZ: Abschlusserklärung zur Konferenz „Umweltverträgliches Fracking?" am 24./25. Juni 2013 in Hannover (Hannover-Erklärung), June 2013

risks and geoscientific uncertainties associated with hydraulic fracturing. Despite this overestimation of risk factors, all three of the evaluated studies draw the conclusion that the exploration and production of unconventional gas through hydraulic fracturing should not be prohibited and can be done under certain conditions without being incompatible with the protection of water and environment – a conclusion that both SGD and BGR share.[181] Another exemplary expert position on the matter of hydraulic fracturing and shale gas exploration in Germany stems from the National Academy of Science and Engineering (Acatech) that describes itself as "[representing] the German scientific and technology communities, at home and abroad. As a working academy, Acatech supports policy-makers and society by providing qualified technical evaluations and forward-looking recommendations."[182] In a project report from 2014, Acatech states that a general ban on hydraulic fracturing cannot be justified by the scientific and technological evidence. Nevertheless, fracking should be used in accordance to strict safety standards, clear regulations and under extensive monitoring. Thanks to already very strict regulations in Germany, the technology could be the subject of further research and application with scientifically supervised demonstration projects and transparent communication activities for the general public.[183]This generally positive stance towards hydraulic fracturing in Germany was again affirmed in 2015 in an official position paper that also took serious the aspect of the public perception of hydraulic fracturing, the communication of risks and acceptance of this technology in the general population.[184] Nine experts with various scientific backgrounds played a crucial role in ExxonMobils' InfoDialogue. Under the lead of Prof. Dietrich Borchardt from the above mentioned Helmholtz Center for Environmental Research (UFZ), these nine people formed an independent expert council and worked on an in-depth evaluation of the implementation of hydraulic fracturing in Germany and the impacts it might have on the environment, the economy and public well-being. The Dialogue ended with the presentation of the final study "Risikostudie Fracking" which summarized the research findings of this independent expert council. It states that according to the experts there is no objective justification in favour of a general ban on hydraulic fracturing. The expert council deems the technology to be controllable if the use of hydraulic fracturing adheres to the recommendations of the experts. Still, a careful approach was advised.[185] These examples show that scientific institutes and associations as well as experts involved in

[181] Stellungnahme der Staatlichen Geologischen Dienste der Deutschen Bundesländer (SGD) und der Bundesanstalt für Geowissenschaften und Rohstoffe (BGR) zu den geowissenschaftlichen Aussagen des UBA-Gutachtens, der Studie NRW und der Risikostudie des ExxonMobil InfoDialogprozesses zum Thema Fracking, Hannover, March 2013

[182] http://www.acatech.de/uk/home-uk/profile.html ; accessed on: 14.10.2015

[183] Emmermann, R.: „Hydraulic Fracturing – eine Technologie in der Diskussion", project report, current status: 4th September 2014, p. 10

[184] acatech (Hrsg.): Hydraulic Fracturing - Eine Technologie in der Diskussion; acatech POSITION, June 2015

[185] Ewen, C. (Hrsg.): Risikostudie Fracking – Übersichtsfassung der Studie „Sicherheit und Umweltverträglichkeit der Fracking-Technologie für die Erdgasgewinnung aus unkonventionellen Quellen", Neutraler Expertenkreis, Informations- und Dialogprozess der ExxonMobil über die Sicherheit und Umweltverträglichkeit der Fracking-Technologie für die Erdgasgewinnung, 2012

ExxonMobils' dialogue process view hydraulic fracturing as not unproblematic but still as a valuable tool for the exploration of unconventional gas resources, which are also seen as necessary or at least beneficent for the future of Germany's energy supply. Thus, these institutions and associations indirectly (or directly in case of the independent expert council) support the position of industry stakeholders involved in gas and oil production. Experts whose position align more with the worries expressed by citizen's initiatives and environmental NGOs and who are against a large-scale usage of hydraulic fracturing in Germany or are even in favour of a complete ban on the application of these technologies are not nearly as vocal and are hard to find.

4.1.3.4 The government and political parties

Given the many different stakeholders involved in the discourse surrounding the drilling for unconventional gas through hydraulic fracturing, it is not surprising that this on-going public debate has found its way into the policy making processes. The increasing public interest in hydraulic fracturing and shale gas exploration leads to a need for Germany's political parties to clarify their position towards this issue and if or how they plan to handle the potential implementation of this technology in Germany. Such a distinctive position on the matter at hand is missing when the current German Government - consisting of the two biggest German political parties, the Christian Democratic Party (CDU/CSU) and the Social Democratic Party (SPD) - is concerned. In their joint coalition agreement from 2013 both CDU/CSU and SPD avoid direct opposition to hydraulic fracturing for shale gas extraction, but they do show a lot of concerns regarding potential risks for both the environment and their citizens' well-being. According to the coalition agreement, before a final agreement on the matter can be made, more research is needed.[186] The coalition agreement details following measures for approaching unconventional gas drilling and hydraulic fracturing in Germany: Findings of research activities are to be assessed in a transparent process that should include all affected parties. Short term changes in water and mining law are to ensure that prior to any search for and extraction of shale gas, there has to be an environmental impact assessment and public participation. The use of toxic substances and the disposal of frack fluid containing those substances in disposal wells are to be refused.[187] According to a draft law from the 23th April 2015, the government plans to forbid hydraulic fracturing and the disposal of frack fluid and deposit water in various wetland areas, especially water and mineral spring's protection areas, natural lakes and water areas used for public water supply. At a depth of 3000 meters and above, shale gas extraction via hydraulic fracturing is also to be prohibited, although exceptions will be made for scientific testing measures concerning the environmental impact of these procedures. Scientific researchers can only use non-hazardous fluids and the testing measures will be accompanied by an independent commission of experts providing yearly field reports beginning in 2018. If the commission of experts grades the use of fracking as acceptable and the Federal Environmental Agency finds the fluids in use to be non-hazardous to water, commercial use of fracking technology may be allowed.

[186] Deutschlands Zukunft gestalten – Koalitionsvertrag zwischen CDU, CSU, 18. legislative term, p. 44
[187] Deutschlands Zukunft gestalten – Koalitionsvertrag zwischen CDU, CSU, 18. legislative term, p. 44

Other restrictions include: only fluids that are considered non- or low hazardous to water may be used. There has to be a full disclosure concerning the chemicals used in the fracturing process as well as the chemicals in the water disposed of in waste water injection wells. Ground and surface water as well as deposit water should be kept under surveillance. The building of sites for fracturing measures including the deposit of frack fluids in disposal wells is prohibited in national parks, conservation areas and especially in so called Natura 2000-areas.[188] The opposition parties in Germany – namely the Democratic Socialist Party (The Left), Alliance '90/ The Greens and the Free Democratic Party Germany (FDP), are more straightforward in their opinion on hydraulic fracturing and shale gas exploration in Germany. Especially the Alliance '90/ The Greens, as Germany's environmental party, argue against the use of hydraulic fracturing and the exploitation of unconventional gas resources. Accordingly, in their 2013 electoral program, the party states that hydraulic fracturing and the underground disposal of frack fluids should be banned entirely.[189] In a decision of the party council in 2014 this position was confirmed with the explicit demand that clear regulations both on a federal and on an EU-level should prohibit the extraction of shale gas and shale oil via hydraulic fracturing as well as the use of environmentally toxic substances.[190] The Democratic Socialist Party in Germany – "the Left"—takes a similar stance. There have been several inquiries and requests by representatives of the Left addressed to the German parliament ("Bundestag") concerning the case of hydraulic fracturing and shale gas exploitation. The newest of these request dates to the 5th May 2015 and in it, the representatives of the Lefts demand a draft law that would prohibit the use of fracking technologies full stop. Flowback from already conducted drilling activities is to be disposed of in an environmentally safe way. Compression in deposit wells is to be prohibited, too.[191] The Free Democratic Party Germany (FDP) holds a different opinion: This liberal oriented party views shale gas exploitation and the use of hydraulic fracturing as a great chance to aid Germany's "Energiewende", the transition from nuclear based energy supply to energy from renewable energy sources, though only if public acceptance and high environmental standards can be guaranteed. According to their 2013 electoral program it has to be ensured that the substances used in the fracturing process do not pose a threat to ground and drinking water reserves. Therefore water authorities should always have veto rights and the implementation of hydraulic fracturing should generally be prohibited in water protection areas.[192]

[188] Deutscher Bundestag, Drucksache 18/4713: Gesetzentwurf der Bundesregierung - Entwurf eines Gesetzes zur Änderung wasser- und naturschutzrechtlicher Vorschriften zur Untersagung und zur Risikominimierung bei den Verfahren der Fracking-Technologie; 18. Legislative period; 23.04.2015
[189] Bündnis 90/Die Grünen, Bundestagswahlprogramm 2013 – Zeit für den Grünen Wandel, p. 34 f.
[190] Bündins 90/Die Grünen, Beschluss des Parteirats – keine Schlupflöcher für Fracking!, Berlin, 7. July 2014
[191] Deutscher Bundestag, Drucksache 18/4810; Antrag: Verbot von Fracking in Deutschland, 18. Legislative period, 05.05.2015,
[192] Bürgerprogramm 2013, Programm der Freien Demokratischen Partei zur Bundestagswahl 2013

4.1.3.5 Other stakeholders

Apart from typical stakeholders such as industry associations, NGOs and citizens' initiatives, there are some other organizations that take a distinctive stance towards the implementation of hydraulic fracturing for drilling purposes in Germany. One of those is ver.di, the United Service Union – a large German trade union.[193] In 2012, the Director of the Federal Utilities and Waste Management Division of ver.di issued a position paper on the exploration and production of unconventional gas resources and the use of hydraulic fracturing. In it, ver.di demands a ban on the exploration and extraction of unconventional shale gas in catchment areas of water protection zones and water extraction facilities, additions to mining laws as well as an obligatory environmental impact assessment and appropriate public participation. Furthermore, a general ban on fracking should not be ruled out.[194] Other organizations concerned with the use of hydraulic fracturing are the Christian Churches in Germany. The AGU, the working group of the environmental officer of the member churches of the Evangelical Church in Germany (EKD)[195], publishes information about unconventional gas exploration and hydraulic fracturing as well as current decisions, position papers and commentaries of the EKD and its member churches on this topic.[196] One of the papers accessible through their website provides an overview of the statements of different protestant and catholic churches in Germany. All of these statements from 15 different churches either speak out against the use of hydraulic fracturing for shale gas extraction in general and argue in favour of a complete ban or press for very strict regulations of hydraulic fracturing and a prohibition on the use of this technology until such regulations are in place.[197]

4.1.4 The Netherlands

4.1.4.1 Industry associations

In the Netherlands, NOGEPA – the Dutch Oil and Gas Exploration and Production Association, is the most active business association with an interest in shale gas exploration. According to their official website, "NOGEPA represents the interests of businesses with licenses to explore for or produce oil and gas in the Netherlands."[198] Its aim is to produce oil and gas in the Netherlands, onshore and offshore, efficiently, safely and with respect for the environment. It also declares that it wants to achieve a positive relationship between the industry and society. There are 16 member companies of NOGEPA. Amongst others we can find Wintershall Noordzee B.V., Cuadrilla

[193] In German: Vereinte Dienstleistungsgewerkschaft (ver.di)
[194] ver.di Bundesfachbereichsvorstand Ver- und Entsorgung: Positionspapier zur Erkundung und Förderung unkonventioneller Erdgasvorkommen, February 2012
[195] In German: Arbeitsgemeinschaft der Umweltbeauftragten der Gliedkirchen der Evangelischen Kirche in Deutschland (AGU)
[196] http://www.ekd.de/agu/themen/energie/fracking.html, accessed on 15.10.2015
[197] Dr. Gudrun Kordecki, Heinrich Mühlenmeier: Kirchliche Stellungnahmen zu Fracking; current stand: 26. Nov. 2014 / 18. March 2015
[198] http://www.nogepa.nl/en-us/nogepa/organisation/ , accessed on 19.10.2015

Resources Netherlands, Dana Petroleum Netherlands B.V. and Nederlandse Aardolie Maatschappij B.V. (NAM).[199] NOGEPA is a member of the International Association of Oil and Gas Producers (OGP) and acts as a regular consulting body by the Dutch Ministry of Infrastructure and Environment and the Ministry of Economic Affairs. NOGEPA also works together with stakeholders at the regional level.[200] As to its engagement in shale gas issues, NOGEPA has initiated an online information platform called "Aardgas-Update" (literally: Update on natural gas)[201] where it offers articles and videos on shale gas extraction and hydraulic fracturing in the Netherlands. It includes critical voices of experts, NGOs or citizens' associations. For example, in a video from 16th September 2013 it addresses public opinion on exploratory and commercial drillings for shale gas and raises questions about the availability of shale gas reservoirs in the Netherlands and the possibility to extract them. This video features commentaries by representatives of VNO/NCW[202] (Confederation of Dutch Industries and Employers), a large employers' organization in the Netherlands which represents the common interests of Dutch business, as well as experts, industry stakeholders and environmental organizations, such as Greenpeace and Friends of the Earth. [203]

4.1.4.2 Environmental NGOs and citizens' associations

Among the most influential global environmental NGOs, Greenpeace and Friends of the Earth are the only NGOs which have taken a position on shale gas exploration in the Netherlands. They did so in a video on fracking.[204] Greenpeace published articles on new developments in shale gas exploration in the Netherlands. However, they have not issued any official statements on their web sites.

Looking at the national scene of environmental NGOs, two Dutch NGOs expressed their position on shale gas in the Netherlands: Milieudefensie[205] and Shaliegasvrij Nederlands[206]. The NGO Milieudefensie is part of the international Friends of the Earth network and focuses on four problem areas: traffic, food, raw materials and energy, the latter including shale gas production.[207] Milieudefensie is very critical of drilling activities in the Netherlands especially where hydraulic fracturing is used. On its website, Milieudefensie offers various articles informing about shale gas, its extraction and possible risks thereof. Articles also feature information about the current situation, protest activities and petitions against the use of hydraulic fracturing and the exploration

[199] A complete list of members can be found here: http://www.nogepa.nl/en-us/nogepa/onze-leden/ , accessed on 19.10.2015

[200] http://www.nogepa.nl/en-us/oil-and-gas/collaboration/ , accessed on 19.10.2015

[201] http://aardgas-update.nl/ ; accessed on: 20.10.2015

[202] http://www.vno-ncw.nl/English/Pages/default.aspx#.ViYtLyud5SE , accessed on 20.10.2015. According to a news article featured on their website, VNO/NCW itself argues in favor of extensive drilling activities in the Netherlands and the northern sea. See also: http://www.vno-ncw.nl/Publicaties/Nieuws/Pages/Ontdekte_gasreserves_Noordzee_goed_nieuws_voor_economie_3157.aspx?source=%2fPages%2fZoek.aspx%3fk%3dschaliegas#.ViYuGiud5SE, accessed on 20.10.2015

[203] http://aardgas-update.nl/2013/09/schaliegas-in-nederland-3/ accessed on 20.10.2015

[204] http://aardgas-update.nl/2013/09/schaliegas-in-nederland-3/ accessed on 20.10.2015

[205] Meaning something along the Lines of „Environment defense"

[206] Literally: „Shale gas free Netherlands"

[207] https://milieudefensie.nl/overons , accessed on 20.10.2015

of unconventional gas in the Netherlands.[208] The second NGO – Schaliegasvrij Nederlands – is a coalition of various regional community groups and citizens' associations as well as environmental organizations asking for a universal moratorium on shale gas production through hydraulic fracturing. Their critical stance is based on their concerns for human health and risks for the environment, especially pollution of air, soil and water. Other unacceptable consequences include damage to the landscape. According to Schaliegasvrij Nederlands, possible advantages like mitigated climate change through lowered CO2 emissions are not proven and therefore do not outweigh the above mentioned risks.[209]

Apart from environmental NGOs, there are several regional citizens' associations dealing with shale gas production in the Netherlands, especially in the municipality of Groningen and Haaren where local residents are affected by conventional drilling activities. One of them is the "Groningen Bodem Beweging" – a grass roots organization and citizens' initiative against the use of fracking technology established in the municipality of Groningen. The movement was founded in 2009 with the goal of defending the interests of its members – local residents who suffered from financial and emotional damages caused by direct and indirect effects of drilling activities in conventional gas fields of Groningen.[210] They claim that since their establishment, the number of earthquakes in the region increased substantially like the earthquake in Huizinge on August 15th, 2012 or the earthquake in Van Buren on September 30th, 2014 which was felt in the city of Groningen.[211]With the increasing numbers of negatively affected citizens, the initiative's main focus has shifted towards the safety of residents of Groningen, although the handling of claims and negotiations with gas producers remains an important issue.[212] Groningen Bodem Beweging was also part of the communication activity "DialoogTafel Groningen", with the goal to further influence local decision-making. The "DialoogTafel Groningen" will be discussed in greater detail in the section on communication activities in the present paper. In 2015, the initiative withdrew from the "DialoogTafel Groningen" when it became clear that several other members of this council ceased participation following the introduction of a national coordinator for Groningen with ties to the above mentioned gas producer Nederlandse Aardolie Maatschappij (NAM).[213]

However, not all residents of Groningen are against the production of unconventional gas in their communities. The citizens' initiative "Groningen Centraal" seeks to become independent of the Dutch state thereby securing potential proceeds from large-scale gas production in their own community..[214] Another association of citizens' is the foundation against fracking in the municipality of Haaren called "Schaliegasvrij Haaren" ("Shale gas free Haaren"). The foundation is active since 2010 and was formed by concerned residents in the areas of Gijzel, Gijzelsestraat and Gezelstraatto when

[208] https://milieudefensie.nl/schaliegas ; accessed on 20.10.2015
[209] https://www.schaliegasvrij.nl/over-ons/, accessed on 20.10.2015
[210] http://www.groninger-bodem-beweging.nl/gbb , accessed on 21.10.2015
[211] ibid.
[212] ibid.
[213] http://www.groninger-bodem-beweging.nl/gbb/gbb-aan-de-dialoogtafel , accessed on 21.10.2015
[214] http://www.groningencentraal.nu/wp/1-eigen-staat-groningen/ , accessed on 21.10.2015

plans for exploratory drilling activities were announced.[215] Apart from the threats to public health and the environment, the shift from an agricultural to an industrial area and the changes to the landscape are also a major concern for the members of this initiative.[216] On their web page, the initiative publishes informative articles and videos, reports on the current situation of shale gas exploration in the Netherlands as well as links to other protest groups such as the aforementioned NGO "Schaliegasvrij Nederlands" and protest activities such as a petition against the implementation of hydraulic fracturing for shale gas production in the Netherlands addressed to the central government.[217] A more moderate citizens' initiative is the movement "StopFracking.nl" which - despite its name - is not strictly against the use of hydraulic fracturing in the Netherlands, but argues in favour of a transparent and non-biased dialogue on fracturing technologies. According to their web presence, the initiative argues for a "sound, independent and accurate investigation and proper disclosure of the investigations that have taken place."[218] Since the members of the initiative lack trust in the reliability of the Dutch government, they try to provide a critical, though open platform for both supporters and opponents of shale gas exploration and fracking to enable the Dutch citizens to form their own informed opinion.[219] The initiative therefore offers several articles and reports on new developments in the gas sector. It also provides a link to a petition against hydraulic fracturing in the Netherlands initiated by the environmental NGO "Milieudefensie".[220] It addresses the Dutch Parliament and demands a ban on fracking because of the threat it poses for the environment, the increase of earthquakes in drilling areas as well as its hindrance of the transition to renewable energy sources.[221] The petition has already gathered over 70,000 signatures.[222] The fight against the use of hydraulic fracturing for shale gas exploration from both citizen's associations as well as (environmental) NGOs led to a further petition (mentioned above) that seeks to end the use of fracking technology especially in the region of Noord-Brabant and in the Netherlands in general. In the accompanying description, the petitioners refer to the unknown consequences of drilling for unconventional gas, like damage to environment, public health and the landscape and demands that the Dutch Government not allow test drilling until these possible impacts are properly assessed and possible risks have been reduced to an acceptable minimum. Further, local, provincial and national authorities should take their obligation to the citizens seriously concerning the disclosure of information about shale gas production. As long as there is no clarity about the

[215] http://www.schaliegasvrij-haaren.nl/over-de-stichting/over-de-stichting , accesed on 21.10.2015
[216] ibid.
[217] http://www.schaliegasvrij-haaren.nl/over-de-stichting/over-de-stichting , accessed on 21.10.2015 and http://www.schaliegasvrij-haaren.nl/petitie , accessed on 21.10.2015
[218] http://www.stopfracking.nl/ , accessed on 21.10.2015, original quote: "Wel pleiten wij voor gedegen, onafhankelijk en nauwkeurig onderzoek en correcte informatieverschaffing over de onderzoeken die hebben plaatsgevonden."
[219] ibid.
[220] http://www.stopfracking.nl/6/Petities_voor_meer_onderzoek_naar_schaliegas , accessed on 21.10.2015
[221] https://milieudefensie.nl/schaliegas/petitie/schaliegas-petitie , accessed on 21.10.2015
[222] https://milieudefensie.nl/schaliegas/petitie/schaliegas-petitie , accessed on 21.10.2015 , as of the same date, the petition counts 70856 signatures.

consequences for the people and the environment, they request a ban on any form of drilling for shale gas be it exploratory or commercial in nature. As of the 20th October 2015, the petition had 5,689 signatures.[223]

4.1.4.3 Academic and think tank experts

It was rather difficult to find distinct expert opinions on shale gas exploration in the Netherlands. One of those comes from energy expert and entrepreneur Rolf Heynen who published the book "Schaliegas in 1 uur en 43 minuten" ("Shale gas in one hour and 43 minutes") that provides an overview of the pros and cons of shale gas production. According to a news article, he is skeptical with regard to the positive economic impacts of shale gas extraction and argues that the Netherlands should let shale gas stay where it is, in the ground.[224] According to an article by Dutch newspaper Trouw, about 55 Professors from different disciplines signed a manifesto against the use of hydraulic fracturing in the Netherlands due to the harm it might cause to the environment by polluting groundwater reserves, soil, air and landscape. These negative consequences of fracturing activities, combined with the still unanswered commercial impact of large scale shale gas production on the Dutch economy, lead these experts to demand a prohibition on fracking and drilling for unconventional gas resources.[225]

4.1.4.4 The government and political parties

The controversial discourse about fracking between different stakeholders has found its way into Dutch policy making. The central government of the Netherlands seems to take the critical voices on shale gas more seriously and the Minister of Economic Affairs announced in July 2015 that there will be no commercial drilling for unconventional gas in the next five years, the term of the current cabinet. Additionally, already existing licenses for shale gas exploration activities won't be renewed. A decision about the long-term perspective of shale gas as an optional future energy supplier will be made in the winter of 2015.[226] On top of that, the Dutch government announced several research initiatives. The Ministries of Economic Affairs, as well as the Ministry of Infrastructure and the Environment have conducted several surveys on the most important social questions related to shale gas production in the Netherlands. Those include questions about risks for the natural and human environments, innovative technologies that could minimize these risks and the place for shale gas exploration within the wider goals of energy transition. Their conclusions provide a broad picture of

[223] http://petities.nl/petitie/stop-schaliegaswinning-in-nederland , accessed on 20.10.2015

[224] Roel van Leeuwen: Schaliegas: nieuwe goud of zeepbel, published on June 22th 2015 on the following website: http://www.solarsolutions.nl/nieuws/schaliegas-nieuwe-goud-of-zeepbel/ ; accessed on 21.10.2015

[225] http://www.trouw.nl/tr/nl/4332/Groen/article/detail/3463516/2013/06/23/Schaliegas-begin-er-gewoon-niet-aan.dhtml , accessed on 21.10.2015; the article also provides a detailed list of the individual signees and their occupations.

[226] News item | 10-07-2015: No extraction of shale gas during the next five years, source: https://www.government.nl/latest/news/2015/07/10/no-extraction-of-shale-gas-during-the-next-five-years, accessed on 21.10.2015

the environmental and social impacts of drilling activities for unconventional gas, though further research is needed.[227]
Additionally, several political parties in the Netherlands have informed their potential voters about their stance towards shale gas production and fracking. The People's Party for Freedom and Democracy (*Volkspartij voor Vrijheid en Democratie, VVD*) argues in favor of large scale shale gas production, citing that natural gas has been produced in the Netherlands since the 1960s and that it plays an important role in the country's energy supply and for the Dutch economy. Although natural gas from unconventional sources is seen as a benefit by the VVD, especially because of the low CO2 emissions associated with it, shale gas extraction via hydraulic fracturing should only be done if it is safe and if the risks are manageable. The VVD therefore wants to put on hold a final decision until current research projects on locations suitable for (safe) extraction, are completed. Despite the generally positive stance, the VVD also advocates investments in the development of renewable energy.[228] The "Partij van de Arbeid" (PvdA), the Dutch equivalent of the UK Labour Party criticizes the Dutch government for neglecting to adequately address and recognize the impact of earthquakes induced by drilling activities for natural gas for a long time. The PvdA believes that it is important to have this issue on the agenda, that gas production should be considerably reduced and that the fears and concerns of the residents of Groningen are taken into account.[229]
The Christian Democratic Party – the Christen Democratisch Appèl (CDA) – states that they are not against shale gas exploration in principle, though it should be conducted in a safe and clean way with special care for drinking water and without hindering a transition to more sustainable energy sources. For them, another important aspect is the acceptance of drilling activities by the Dutch population. To ensure a decision on shale gas production in the Netherlands that satisfies everyone, the CDA advocates to first hold a broad discussion on the usefulness or necessity of unconventional gas exploration. Additionally, the CDA endorses further research on top of the research done by other countries on risks and consequences of shale gas extraction and to start gas production only after the results of these research activities are available. The CDA also addresses other negative consequences of drilling activities particularly in the region of Groningen where damage caused by earthquakes has led to a depreciation of house values. Other municipalities where exploratory drilling activities are planned might suffer the same negative outcomes. Therefore, the Dutch government should closely examine possible consequences for residents of municipalities where drilling activities are planned and clarify how it will deal with the problems already faced by residents of Groningen, before any kind of exploratory drilling activities can take place.[230] A similar opinion on the matter of hydraulic fracturing and shale gas extraction is held by the Social Democrats – the Democraten 66 (D66). They, too, argue that there should be more knowledge about safety concerns and environmental risks especially where threats to the ground, to drinking water and the handling with waste water are

[227] https://www.rijksoverheid.nl/onderwerpen/schaliegas/inhoud/onderzoeken-naar-schaliegas , accessed on 21.10.2015
[228] http://www.vvd.nl/standpunten/192/schaliegas#lezen , accessed on 21.10.2015
[229] http://www.pvda.nl/standpunten/Duurzaamheid+en+milieu/Gaswinning ; accessed on 22.10.2015
[230] https://www.cda.nl/standpunten/standpunt/schaliegas/ , accessed on 22.10.2015

concerned. Other questions include the general usefulness and necessity of shale gas production and the effect unconventional gas production has on the transition to a green economy, climate neutrality and renewable energy. D66 insists that prior to any decision on how the state should proceed in regard to shale gas production, these and other questions have to be answered and it has to be clear that the benefits of unconventional gas production will actually outweigh its disadvantages.[231]

[231] https://d66.nl/standpunt-over/schaliegas-2/ , accessed on 22.10.2015

5 REVIEW OF COMMUNICATION ACTIVITIES ON SHALE

5.1 Introduction

Another part of our research was dedicated to different communication activities on shale gas exploration and hydraulic fracturing geared towards the public. In the four European countries we are concentrating on, there was some though very little information concerning such communication activities. Most of the communication activities were rather small-scale and addressed the local population directly affected by drilling activities. Exceptions were the public dialogue initiated by ExxonMobil in Germany, the campaign of the Polish Ministry of Environment *Let's Talk about Shale Gas*, a regional campaign in the North of Poland *Together about Shale Gas* and the project *Public Engagement in Shale Gas and Oil Developments* by the Department of Energy and Climate Change in the UK.

5.1.1 Poland

Communication on shale gas in Poland has been organized by various organizations and in various locations. PGNiG addressed its communication activities towards people living in the vicinity of the company's drilling sites. The Ministry of Environment reached out to inhabitants of the Southern and Eastern Poland through two public hearings organized in the main cities of the two regions. The think tank ISE targeted local administration with trainings in environmental regulations and planning procedures and with knowledge about the Canadian and the U.S. experiences with shale gas. The most experimental format was adopted by the NGO from Gdansk, FREE, which organized local dialogue committees in 7 different locations and carried out a series of meetings during which members of these committees invited various experts and ask about various aspects of shale gas exploration. The main challenge of this dialogue process was to find a sufficient number of participants who would regularly attend the meetings. Most of the sites where drilling for shale gas took place, in one way or another, have been informed about the process.

Name	Let's talk about shale gas (Porozmawiajmy o lupkach)
Organizer	Ministry of Environment
Location	Northern Poland (pomorskie voivodship, kujawsko-pomorskie voivodship and warmińsko-mazurskie voivodship) and the region called Lubelszczyzna (lubelskie voivodship)
Time period	2012-2013
Activities involved	Two public hearings: October 1st, 2013 in Gdańsku and October 8th, 2013 in Lublinie; Internet website; on-line consultations; public opinion survey

Final product	Final report summing up opinions expressed in survey and during the public hearings[232]
Input into policy process	The final report summing up the work of the local dialogue committees was supposed to give an input for institutions regulating and monitoring shale gas exploration
Name	Razem o lupkach (Together about shale gas)
Organizer	Foundation for the Electro-Energy Solutions in Gdansk (Fundacja Rozwiazan Elektroenergetycznych w Gdansku, FREE)
Location	Northern Poland, regions: kartuski, lęborski, wejherowski (pomorskie voivodship), radziejowski, rypiński (kujawsko-pomorskie voivodship), braniewski, elbląski (warmińsko-mazurskie voivodship)
Time period	September 2013 – October 2014
Activities involved	Local Dialogue Committees (LKD)
Final product	Final reports and social contracts signed between local communities and companies
Input into policy process	The final report was supposed to give an input for institutions regulating and monitoring shale gas exploration but no traces of this input can be found
Name	Gas for the Community (Gaz dla gminy)
Organizer	Institute for Energy Studies (*Instytut Studiow Energetycznych, ISE*)
Location	Areas of shale gas licenses and the capital city: Warsaw, Zamosc, Lublin, Plock, Gdansk, Olsztyn, Starogard Gdanski, Ostroleka, Radom, Torun, Tomaszow Lubelski, Siedlce, Bydgoszcz, Katowice, Wolomin, Smoldzino, Sokolow Podlaski, Krokowa, Kielce, Lublin, Glowczyce
Time period	2013 – 2015
Activities involved	Trainings addressed to local administration, conferences on shale gas
Final product	Conferences
Input into policy process	At the level of local practices
Name	Local meeting
Organizer	Polish Oil&Gas Mining Company (*Polskie Górnictwo Naftowe i Gazownictwo S.A., PGNiG*)
Location	Areas of shale gas licenses of PGNiG
Time period	2012 – 2015
Activities involved	Information points, open meetings with local communities, participation in conferences[233]

[232] http://lupki.mos.gov.pl/nagrania-i-opinie-pisemne/sprawozdanie.pdf
[233] http://www.lupkipolskie.pl/lupki-w-polsce/program-dzialan-informacyjnych

Final product	Not specified
Input into policy process	Not specified

5.1.2 The United Kingdom

One of the bigger communication activities regarding public perception of shale gas in the UK consisted in a project developed by the Department of Energy and Climate Change that was funded by TNS BMRB, a social research agency focusing on both UK and international policymakers, and sciencewise, a program of the Department for Business, Innovation and Skills that focuses on the public dialogues in policy making concerning issues of science and technologies. This project called "Public engagement in shale gas and oil developments" took place in 2014 with the aim to learn more about how to inform and engage the general public if shale gas exploration is proposed in their community as well as when they should be engaged and by whom. This engagement process on topics like shale gas and oil as well as hydraulic fracturing was the main purpose of the project, while public opinion on the approach to unconventional gas exploration by the British Government and the Department of Energy and Climate Change wasn't the centre of attention. The dialogue process "consisted of a two-wave qualitative and deliberative methodology, used to help participants build knowledge around quite technical information on shale gas and oil and the regulatory arrangements in place, before focusing on public engagement. The dialogues were undertaken in three areas –Northampton, Liverpool and Winchester –engaging a total of 71 people."[234] The project resulted in several papers and articles on the outcomes of the dialogues as well as the process itself and is expected to have a positive effect on policy making regarding the engagement of the public where exploration of unconventional gas (and oil) through hydraulic fracturing is concerned. Another communication activity was organized by the representative of UK onshore Oil and Gas industry (UKOOG).[235] The 'Let's talk about shale' event can mainly be seen as an interactive information campaign with the goal of educating the public on the topic by both academic experts and industry representatives, as well as providing a platform for questions from the public. The activity took place in the North West and the East Midlands, specifically in Blackpool, Preston, Lincoln and Worksop. Though the project ended, he official webpage can still be accessed and lists the (critical) questions of the British population and their answers.[236]

Name	Project: "Public engagement in shale gas and oil developments"
Organizer	Department of Energy and Climate Change, funded by: TNS BMRB; sciencewise (Department for Business, Innovation and

[234] Icaro (Inside into focus): *Evaluating the public dialogue process on shale gas and oil developments*, report for Sciencewise, 2014

[235] Source: http://www.ukoog.org.uk/about-ukoog/press-releases/133-general-public-encouraged-to-ask-questoins-about-natural-gas-from-shale, accessed on 20.11.2015

[236] Source: http://www.talkaboutshale.com/index.php , accessed on 20.11.2015

	Skills)
Location	Northampton, Liverpool, Winchester
Time period	October 2013 – December 2014
Activities involved	Dialogue workshops in Winchester, Northampton and Liverpool in February/March 2014, with a total of 71 people. An illustration of the public dialogue process can be found in a case study published by scienecewise.
Final products	"Public engagement with shale gas and oil" (2014): Report on the results and findings of the project A case study about the project "Evaluating the public dialogue process on shale gas and oil developments" (2014): Report for Sciencewise by Icaro The papers can be accessed here: http://www.sciencewise-erc.org.uk/cms/public-engagement-in-shale-gas-and-oil-developments
Input into policy process	
Name	'Let's talk about shale'
Organizer	UK Onshore Oil and Gas industry (UKOOG)
Location	Blackpool, Preston, Lincoln and Worksop
Time period	2014
Activities involved	'Let's talk about shale' digi-van: Bus toruing the locations providing information about natural gas development and collecting questions of the general public Local presentations by geologists, academics and representatives of the business community Interactive website for asking questions and providing answers Public relations to promote the project
Final products	The website http://www.talkaboutshale.com/index.php
Input into policy process	

5.1.3 Germany

In the case of Germany, our findings suggest that there are usually small scale communication activities targeted at the local population that are either part of regional campaigning activities of different political parties or organized by citizens' initiatives and NGOs. Some examples include the "Citizen's dialogue on Fracking" that took place on April 29th 2015 and was organized by the regional association of the Christian Democratic Party in Radolfzell[237] and the similar "Citizen's Dialogue on Fracking: Fracking in our own Backyard?" on February 2nd 2014 on behalf of the regional

[237] http://www.wochenblatt.net/heute/nachrichten/article/buergerdialog-zu-fracking.html , accessed on October 28th 2015

association of the Social Democratic Party in Kempen.[238] Another example are two different events with the same title - "Fracking- Curse or Blessing?": One was organized by the regional citizen's initiative against CO2-respitories in Welt on July 23th 2015 and featured a panel discussion with a member of the initiative and a representative of industry stakeholder RWE Dea followed by a general discussion with citizens.[239] The other one was part of the political activities of the more liberal leaning Friedrich
Naumann Foundation and also featured a panel discussion between a member of the Free Democratic Party and a representative of NABU, an environmental NGO.[240]
Apart from these rather small communication activities there is only one major communication and information initiative about shale gas exploration and hydraulic fracturing to be found: ExxonMobil's "InfoDialog Fracking".[241] As an influential industry stakeholder and one of the major players in natural gas extraction in Europe it was quite remarkable that ExxonMobil would take this course and rely on a broader public engagement making an effort to win public support with this extensive information and communication campaign.[242] The "InfoDialog Fracking" started in spring 2011 and lasted a year with continuing activity until 2014. An independent expert panel was installed to work on an in-depth study on the current level of knowledge on hydraulic fracturing and the risks associated with it. The experts were working in close communication with different actors and stakeholders in the affected communities. In a total of 17 events in Münster and Osnabrück the experts, the different actors and stakeholders as well as the general public came together to discuss the current findings as well as further issues and open questions. The InfoDialog resulted in an extensive study "Risikostudie Fracking". There was no comparable citizen's dialogue or similar communication activity conducted by the German government.
Interestingly, the year that ExxonMobil's "InfoDialog Fracking" began, was also the start of a broad participation campaign of the Federal Ministry of Education and Research called the "Citizen's Dialogue on Future Technologies". The first round of these Citizen's Dialogues which consisted of eight regional dialogues with 100 citizens each dealt with the question of the future of German energy supply. Shortly after the Fukushima incident the discussion of course focused on issues concerning nuclear energy, Germany's withdrawal from it and the problem of nuclear waste disposal. Other topics included renewable energy sources, decentralization, energy efficiency as well as electricity networks and storage. During the whole process, there was no mention of the case of shale gas and hydraulic fracturing, neither in the early information papers, nor in

[238] Sozialdemokratische Partei Deutschlands; SPD Ortsverein Kempen, Pressemitteilung 04.09.2014 (press statement from September 9th 2014)
[239] http://www.nordfriesland-evangelisch.de/42.0.html?&tx_ttnews[tt_news]=133&cHash=ba38abfc0f1ee7c393f803745c24d6e9 ,accessed on October 28th 2015
[240] https://www.freiheit.org/content/fracking-ist-minimal-invasiver-bergbau , accessed on October 28th 2015; The session is available on YouTube: https://www.youtube.com/watch?v=mIgMWLz4uIg , accessed on October 28th 2015
[241] About the "InfoDialog" see: http://dialog-erdgasundfrac.de/, last accessed on October 28th 2015
[242] See also: Naumann , M.; Philippi, A.: ExxonMobil in Europe's Shale Gas Fields: Quitting Early or Fighting It Out? In: Journal of European Management and Public Affairs Studies, 2014, Vol. 1 No. 2

people's discussion or in the resulting citizen's report. This might have been an indication of a rather sudden emergence of the controversy surrounding fracking technology, if it weren't for the aforementioned InfoDialog by ExxonMobil. Why the risks associated with hydraulic fracturing and shale gas extraction as well as its potential to secure future energy supply wasn't discussed at the Citizen's Dialogue on Future Technologies remains an open question.

Name	"Bürgerdialog Fracking" (Citizen's Dialog on Fracking)
Organizer	CDU Stadtverband Radolfzell (regional association of the Christian Democratic Party in Radolfzell)
Location	Radolfzell, Zunfthaus der Narizella, Kaufhausstr. 3
Time period	29.04.2015; Start: 8 pm
Activities involved	Discussion with member of the Bundestag Andreas Jung
Final product	No final product
Input into policy process	Event was part of regional campaigning activities
Name	"Bürgerdialog: Fracking vor der eigenen Haustür?" (Citizen's Dialog on Fracking: Facking in our own Backyard?)
Organizer	SPD Kempen (regional association of the Social Democratic Party in Kempen)
Location	Kempen, Poststuben Zens, Königstraße 14
Time period	02.09.2014; Start: 7.30 pm
Activities involved	presentation from Norbert Meesters (environmental spokesperson for the SPD provincial parliamentary party in the state of North Rhine-Westphalia; member of the Bundestag) Discussion with citizens and other members of the SPD
Final product	No final product
Input into policy process	Event was part of regional campaigning activities
Name	Fracking – Fluch oder Segen? (Fracking – Curse or Blessing?)
Organizer	Citizen's initiative against CO2-repository (Bürgerinitiative gegen CO^2-Endlager e.V.)
Location	Welt, Sommerkirche
Time period	23.07.2015
Activities involved	Panel discussion (Dr. Christian Buecker (RWE Dea) and Dr. Reinhard Knof (Citizen's initiative against CO^2-repository) Discussion with citizens
Final product	No final product
Input into policy process	Part of information activities of regional citizen's initiatives with industry stakeholders
Name	Fracking – Fluch oder Segen? (Fracking – Curse or Blessing?)
Organizer	Friedrich Naumann Foundation of Freedom (Foundation for liberal politics in Germany)
Location	Einstein Forum, Potsdam
Time period	28.03.2013

Activities involved	Panel discussion (Dr. Ingo Kapp (GFZ), Prof. Dr.-Ing. Martin Neumann (FDP/Free Democratic Party, member of the Bundestag), Ulf Sieberg (NABU (environmental NGO))
Final product	No final product, Session available on youtube
Input into policy process	Part of political activities of the liberal Friedrich Naumann Foundation (close to the political party FDP)
Name	InfoDialog Fracking
Organizer	Exxon Mobil
Location	Münster and Osnabrück
Time period	07.04.2011 – 25.04.2012 (continuing in the years 2012 – 2014)
Activities involved	An independent expert panel was working on an extensive study on the level of knowledge on fracking - in close communication with different actors and stakeholders from the affected regions (about 17 events total)
Final product	Study "Risikostudie Fracking"
Input into policy process	

5.1.4 The Netherlands

Only one broader communication activity could be identified in the Netherlands: The "Dialoog Tafel Groningen" took place between autumn 2013 and spring 2014 and its purpose was an in-depth discussion of the (negative) effects the use of hydraulic fracturing had on the region and what could be potential solutions. The province of Groningen is well-known for its shale gas exploration sites and the increasing of earthquake and seismic activity following the use hydraulic fracturing. After citizen's protests and engagement in initiatives against hydraulic fracturing, the community decided to organize the "Dialoog Tafel Groningen". In 2013 a committee "presented a report with measures to offset the negative impacts of gas extraction. These plans were developed in consultation with residents, businesses, government and NAM[243]. They are focused on safety, quality of life and economic development […]."[244] The advice the committee compiled was presented in 2014 and an agreement between the government, the providence of Groningen and nine other municipalities was signed that also contains measures to compensate for the negative effects caused by the drilling for shale gas. In this sense, the "Dialoog Tafel Groningen" was less of a communication activity geared towards increasing public knowledge about hydraulic fracturing or giving the general public a place to discuss, but more of a tool to come to an agreement between dissenting demands of different stakeholders – most notably between industry stakeholders like the local drilling company and the municipality and its citizens resulting in concrete

[243] NAM stands for "Nederlandse Aardolie Maatschappij" – a Dutch natural gas society, a local gas exploration and production company.
[244] Source: http://www.dialoogtafelgroningen.nl/de-tafel; Accessed on: 26.08.2015

measures of compensation like the payment of an estimated 1,2 billion euros over a period of five years.[245]

Name	Dialoog Tafel Groningen
Organizer	Province of Groningen, Commission Meijer
Location	Groningen
Time period	Autumn 2013 – Beginning of 2014
Activities involved	Formation of a committee working on a report with measures to offset the negative impacts of gas extraction. Consultations with residents, businesses, governments and NAM. Presentation of the report and the advice formulated
Final products	Final Report 2013 Presentation of Advice 2014 Agreement between Groningen and other municipalities and the Government 2014
Input into policy process	"Between the government, the province of Groningen and nine municipalities an agreement was signed on restoring confidence and restoring trust (PDF document), which includes agreements on compensation measures for the negative effects of the gas. The NAM endorses those agreements. The total package is estimated for a period of five years at 1.2 billion euros. The agreement is an essential role for the dialogue table in the design and implementation of the plans."

[245] Ebd.

6 REVIEW OF SURVEYS AND PUBLIC CONSULTATION ON SHALE GAS AT THE EU LEVEL

6.1 Introduction

This part of the report presents results of two Eurobarometer surveys on shale gas (2012 and 2015) and a public consultation on shale gas that was launched by the European Commission in the period between 20 December 2012 and 23 March 2013. While the Barometer surveys give representative results for the studied countries, the consultation can only be analysed on the population of people who took part in the consultation processes. It is, however, interesting to see that the majority of Commission's questionnaires were filled in and submitted from Poland.

6.1.1 Eurobarometer 2012

Attitudes to shale gas extraction have also been studied at the EU-level. In September 2012, a Eurobarometer survey was carried out on attitudes of Europeans towards air quality and was published as a report in January 2013.[246] Views on shale gas extraction were included in the survey. The results have revealed that 74% of respondents say they would be concerned if there were to be a shale gas project located in their neighbourhood, with 40% being very concerned (p. 8).

6.1.1.1 Regulations and energy options

On regulation, 61% agree there should be harmonised and consistent approaches across the EU to manage unconventional fossil fuels extraction such as shale gas. More than six out of ten agree that harmonised and consistent approaches to the management of unconventional fossil fuels extraction should be developed in the EU. Respondents were asked to what extent they agreed that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas. Most (61%) agree that harmonised and consistent approaches should be developed: 28% totally agree, and a further 33% tend to agree. Three in ten disagree that harmonised and consistent approaches should be developed: 17% totally disagree while 13% tend to disagree (p. 108).

Respondents in the Netherlands (77%), Lithuania (73%) and Belgium (72%) are the most likely to agree that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas. Respondents in Ireland and Germany are the most likely to say they totally agree that harmonised and consistent approaches should be developed (42% and 41% respectively) (p. 108).

A majority of respondents in 25 countries agree that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas. The exceptions are Austria and Sweden, where 33% and 45% of respondents respectively agree. Austria is the only country where the majority

[246] http://ec.europa.eu/public_opinion/flash/fl_360_en.pdf

disagree that harmonised and consistent approaches should be developed (61%). In Austria 34% totally disagree with this idea, as do 32% of French respondents. (p. 108)
There are only a few socio-demographic differences of note. The older the respondent, the less likely they are to agree that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas. For example 71% of 15-24 year olds agree with this idea, compared to 55% of those aged 55+ (p. 109).
Respondents were asked to identify the energy options they thought should be prioritised now, with a view to the next 30 years. Respondents were least likely to mention unconventional fossil fuels such as shale gas (9%) and conventional fossil fuels (8%) (p. 100).
Respondents living in EU15 countries are much more likely to mention renewable energy sources than those living in NMS12 countries (74% vs. 57%). Respondents in NMS12 countries, on the other hand, are more likely to mention unconventional fossil fuels such as shale gas (17% vs. 7% of EU15), although the respective shares are much lower (p. 100).
Almost one third of respondents living in Poland mention unconventional fossil fuels such as shale gas as an energy option that should be prioritised (32%). This is considerably higher than the EU average of 9%. It is also notably higher than all the other EU countries, where between 3% and 11% of respondents think that unconventional fossil fuels such as shale gas should be prioritised. For example only 3% of Swedish, Finnish and Italian respondents mention these fuels as a priority energy option (p. 101).

6.1.1.2 Socio-demographic analysis

Socio-demographic analysis highlights only a few notable differences. Women are more likely than men to say that they would be concerned if a shale gas project were to be located in their neighbourhood (79% vs. 69%). This was also found in the country level polls, for example in the UK in the studies carried out by the team from the Nottingham University. Respondents who think that emissions from cars and trucks and emissions from industrial production and from fossil fuel power stations have an impact on air quality are all more likely to be concerned if a shale gas project were to be located in their neighbourhood compared to those who say these emissions do not have an impact. For example 74% of those who say emissions from cars and trucks have an impact on air quality would be concerned if a shale gas project were to be located in their neighbourhood, compared to 66% of those who say emissions from cars and trucks have no impact (p. 106).
The longer a respondent remained in education, the more likely they are to agree that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas. Half of those who completed their education aged 15 or younger agree with this, compared to 63% of those who completed their education aged 20+. Employees are the most likely to agree that harmonised and consistent approaches should be developed in the EU to manage unconventional fossil fuels extraction, such as shale gas (65%) (p. 109).

6.1.1.3 EU15 and NMS12

Respondents living in EU15 countries are more likely to be concerned if a shale gas project were to be located in their neighbourhood than their NMS12 counterparts (77% vs. 61%). Respondents living in France (89%), Germany (82%), Ireland, Luxembourg (both 81%) and Austria (80%) are the most likely to be concerned if a shale gas project were to be located in their neighbourhood. In fact at least half of all respondents in France (54%), Austria (52%) Ireland (51%) Germany and Bulgaria (both 50%) say they would be very concerned if a shale gas project were to be located in their neighbourhood. Poland is the only country where fewer than half of all respondents said they would be concerned to some degree (46%). Polish respondents are more likely to say they are not concerned (49%). This is the only EU country where this is the case. There is a high level of uncertainty amongst respondents in Hungary, Estonia and Malta (all 16% don't know) (p. 105).

6.1.2 Public consultation of the European Commission

In the period between 20 December 2012 and 23 March 2013, the European Commission conducted public consultation on the subject of unconventional fossil fuels (e.g. shale gas) in Europe.[247] There were 22,875 responses to the consultation.
The majority of respondents (more than 50%) from many EU countries (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Ireland, Italy, Luxembourg, Latvia, Malta, the Netherlands, Romania, Sweden, Slovak Republic and the UK) believe that unconventional fossil fuels should not be developed in Europe at all. Note however that for some countries, only a few respondents participated in the public consultation. Respondents from Poland are the most favourable to unconventional fossil fuels, with more than 59% of respondents believing that unconventional fossil fuels should be developed in Europe anyway.

6.1.2.1 Individual respondents

There were 22,122 responses from individuals. More than 90% of citizen responses came from five EU countries: Poland, France, Romania, Spain and Germany. As to the general attitude to unconventional fossil fuels, 32.5% of respondents believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe anyway; 28.9% of respondents believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe only if proper health and environmental safeguards are in place; 37.5% believe unconventional fossil fuels extraction (e.g. shale gas) should not be developed in Europe at all.

6.1.2.2 Companies and organizations

There were 696 responses from organisations, including 33% from companies and 32% from NGOs. The countries that registered the highest share of respondents from

[247] http://ec.europa.eu/environment/integration/energy/pdf/Shale%20gas%20consultation_report.pdf

companies and organisations favourable to the development of unconventional fossil fuels in Europe anyway are Lithuania (3 out of 5 respondents), the Slovak Republic (1 out of 2), the United States (3 out of 6), Poland (more than 45% of 111 respondents) and Hungary (1 out of 4 respondents).
For the majority of academic institutions, companies, or industry or trade associations responding, unconventional fossil fuels should be developed in Europe only if proper health and environmental safeguards are in place. For the majority of the environmental or social non-governmental organisations or intergovernmental organisations responding, unconventional fossil fuels should not be developed in Europe at all. The types of institutions most favourable to the development of unconventional fossil fuels are companies and academic institutions, with nearly 30% and 25% of respondents respectively considering that unconventional fossil fuels should be developed in Europe anyway.
The countries that registered the highest share of respondents representing companies and organisations favourable to the ban on unconventional fossil fuels in Europe are France (more than 90% of 83 respondents), Italy (8 out of 10 respondents), Romania (75.8% of 41 respondents), Austria (9 out of 12 respondents) and the Czech Republic (72.2% of 18 respondents).

6.1.2.3 Benefits

The reduction of EU energy import dependency was identified by respondents as the main benefit that unconventional fossil fuels could bring (59% of respondents), followed by the strengthening of EU negotiation position with external energy supplies and the diversification of the energy mix; However, the difference in the share of respondents identifying one potential benefit as major or significant from one potential benefit to the other is relatively small. The potential benefit that was least often identified as major or significant is the balancing of the EU electrical grid, although 48% of respondents identified it as potentially major or significant.
Less than one third of the respondents from the majority of EU countries identified the benefits to be potentially major or significant. The countries in which more than one third of respondents identified as major or significant are: Bulgaria, Hungary, Lithuania, Poland, Portugal and the Slovak Republic. Of these countries, Poland is clearly the country in which the amount of benefits considered as major or significant appeared to be larger, with an average of 87% of the eleven benefits identified as such by 11,175 respondents living in Poland. Outside the EU, Norwegian respondents (11) identified the highest share of benefits as potentially major or significant (about 60%).
For academic institutions, and industry and trade associations, the benefit most commonly considered as major or significant is technological innovation (respectively 80% and 69% of respondents for these types of institutions). For private companies, the benefit most commonly considered as major or significant is the decrease in the EU's energy import dependency (69% of respondents). For social or environmental NGOs, the benefit most commonly considered as major or significant is the increase in private investments (16% of respondents). For almost all kinds of organisations (except the "other" category), the benefit that is least commonly identified as major or significant is the balance of the energy grid.

Academic institutions, industry and trade associations, along with companies are the types of institutions that identified the largest shares of benefits as major or significant. On the other hand, social and environmental NGOs and intergovernmental organisations considered that only a small share of benefits could be major or significant.

6.1.2.4 Challenges

The lack of transparency and public information was identified by respondents as the main challenge that developers of unconventional fossil fuels must address (63% identified it as a major or significant challenge). Several other challenges were identified by the majority of respondents as major or significant: inadequate legislation applicable to these projects, lack of public acceptance, new problems related to water quality and the quantity of water used, lack of capacity public authorities to supervise a large number of facilities, lack of a level playing field for operators in Europe due to different national approaches, new problems related to soil as well as nature and biodiversity, and long term geological risks. All these responses were identified as major or significant by more than 50% of respondents.

Individual respondents from almost all EU countries identified, on average, more than 50% (and most of them more than 70%) of the challenges to be potentially major or significant. In Poland, 18% of the challenges were identified, on average, as major or significant. Poland is the country in which the amount of challenges considered as major or significant by individual respondents appeared to be very small compared to all other countries. Outside the EU, Norwegian respondents identified the lowest share of challenges as potentially major or significant (about 43%).

6.1.2.5 Recommendation to minimise risks

Ensuring adequate responses in case of emergency was identified by respondents as the main recommendation to avoid or minimise risks (88% identified it as major or significant challenge). All presented recommendations were assessed as very important or important by at least 63% of respondents.

The homogeneity of answers for all the different types of organisations – a very high proportion of respondents (88% in average), independently of the type of organisation assessed the recommendations as very important or important. The relative homogeneity of answers for all the different types of recommendations. There is not much difference between the share of respondents from one type of institution that identify one recommendation as very important or important and another. Over 80% of the respondents identified as academic institutions, industry and trade organisations agreed that planning ahead the developments, underground and operational risk assessment, well integrity, continual monitoring, disclosure of data, proper waste management, minimisation of fracturing fluids use, air emission control, liability regimes, wells inspection, independent evaluation, and adequate responses in case of emergency are very important or important. Almost all predefined recommendation were considered as very important or important by more than 80% of environmental NGOs and intergovernmental organisations.

This breakdown shows also that there is not much difference between organisations from different countries that consider that recommendations are very important or important (at least 79% for Poland and 86% in average for EU countries). Out of the

EU, respondents appeared to consider in the same high proportion the recommendations to be very important or important as compared with the EU average.

6.1.3 Flash Eurobarometer 2015

The Directorate-General for Environment (DG ENV) commissioned this survey to be carried out in 12 regions within the EU where shale gas projects have been permitted or may be planned: Nordjylland and Hovedstäden in Denmark, North Brabant and Flevoland in the Netherlands, Lubelski and Pomorskie in Poland, the North East and South East regions in Romania, the Basque Community, Cantabria and Castile-Leon in Spain, and Lancashire in the UK. The survey addressed the following issues: respondents' awareness of existing, past or potential shale gas projects in their region; how informed respondents feel about these projects and how effectively they consider they can express their views; the perceived opportunities and challenges these projects might bring; the EU's role in shale gas exploration and production.[248]
The report based on the Flash Eurobarometer is not yet out, therefore, we are presenting here answers to some general questions as they were distributed across the studied countries.

Q1. Have you read, heard or seen information about shale gas projects that are being carried out or are planned in your region? These projects use a technique commonly called "hydraulic fracturing" or "fracking".

	Denmark	The Netherlands	The United Kingdom	Poland	Romania	Spain
Yes	63%	36%	80%	68%	58%	57%
No	36%	64%	20%	32%	42%	43%

[248] https://open-data.europa.eu/pl/data/dataset/S2066_420_ENG , accessed on 26.11.2015

Q2. Which possible opportunities do these projects bring for you or your region? Firstly?

	Denmark	The Netherlands	The United Kingdom	Poland	Romania	Spain
Local jobs	29%	38%	56%	46%	65%	44%
Acquisition of skills	2%	2%	3%	1%	1%	2%
Better roads and other infrastructure	4%	9%	1%	7%	5%	7%
A domestic source of energy	28%	26%	19%	27%	13%	25%
Revenues for the local community	14%	15%	16%	10%	10%	14%

Q3. Which possible challenges do these projects raise for you or your region? Firstly?

	Denmark	The Netherlands	The United Kingdom	Poland	Romania	Spain
Risks to health	15%	16%	15%	11%	18%	12%
Pollution of water and air	58%	26%	24%	22%	40%	31%
Earth tremors	3%	26%	19%	10%	16%	13%
A drop in property values	5%	12%	10%	10%	2%	4%
A negative impact on other sectors, such as agriculture or tourism	7%	10%	13%	19%	10%	18%
Traffic hazards	2%	2%	7%	4%	3%	2%

Q4. Which of the following statements comes closest to your views?

	Denmark	The Netherlands	The United Kingdom	Poland	Romania	Spain
The EU should let Member States decide how shale gas exploration and production should be undertaken.	30%	22%	33%	58%	37%	16%
The EU should continue their current approach of providing recommendations but not adopt new legislation.	18%	8%	15%	8%	13%	10%
The EU should go further and adopt new legislation to regulate shale gas exploration and production.	18%	27%	21%	23%	22%	30%
The EU should consider banning hydraulic fracturing (or "fracking").	26%	34%	23%	7%	23%	37%

7 CONCLUSIONS

The report collects a variety of data on public perceptions on shale gas from four EU Member States: Poland, the United Kingdom, Germany and the Netherlands. Data form surveys and opinion polls show that proportion of supporters and opponents of shale gas are vary in the studied societies. While the Polish public shows most support for shale gas, the German population is most opposed to shale gas development. In the United Kingdom we can observe that the number of the undecided people grew over the last years and may people today do not know which side they should take in the shale gas debate. In the Netherlands we can observe quite a high acceptance for test drilling but a high opposition towards shale gas exploration.

The EU-level surveys and consultations confirm results from the country-level studies. Polish participants in the European Commission's consultation were most keen on supporting shale gas exploration and they also took part in the consultation in the largest number. The Eurobarometer, on the other hand, showed that around one third of the respondents selected in regions where shale gas projects have been permitted or may be planned are for the EU-level ban on fracking, except for Poland. People most widely fear air and water pollution but some see other challenges like negative impact on other sectors, such as agriculture or tourism or earth tremors.

Our review also shows how citizens organize opposition against shale gas and how various types of environmental organizations support them in this effort. A great challenge resides in communicating shale gas projects to the public. The report shows that various communication campaigns, trainings and dialogue processes were launched in the studied countries. Some of them had a local character, others were undertaken at a regional scale. However, one should also note that communication cannot be successful if the public does not trust the authorities and the experts. The report also reviewed positions of major think tanks and academic experts in the studied countries. The UK example of the Frackademics report shows that there organizations who are monitoring the work of experts and are willing to uncover their biases and relations with industries and governments. The expectations about neutrality and objectivity of experts are high among the public.

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