

Carte blanche for fracking

How the European Commission's new advisory group is letting the shale gas industry set the agenda

Executive Summary:

The European Commission is publicly talking up its climate ambition on the road to the UN climate talks in Paris this December. But in reality, its recently-established advisory group for the evaluation of shale gas development is opening the back door to fracking across Europe, despite massive public opposition.

The newly created “European Science and Technology Network on Unconventional Hydrocarbon Extraction” (or Network) is supposed to assess current projects, as well as recommend which technologies are appropriate and safe enough for Europe. Unfortunately for the public, the majority of its members (including those from industry, academia and other research bodies) have a clear financial stake in the expansion of fracking and are in no position to objectively assess its safety. Moreover, many have aggressively lobbied for weaker safety rules.

The Network is composed of 74 members, 14 of whom work for the European Commission. Of the 60 that do not:

- Fewer than 10% of members are from civil society
- More than 70% of members either represent or have financial links to the fracking industry; two-thirds of academics and research organisations involved have links to the fracking industry.
- All five working group chairs are fracking proponents, and some have even lobbied against stronger safety rules

This conflict of interest is not only jeopardising public safety and the climate, but also citizens' faith in the European Commission being able to put their interests before industry profit. Given the public opposition to fracking in Europe and the well-documented associated environmental problems, the European Commission should not listen to a lobby that wants to move the goalposts from asking not “if” Europe wants fracking, but “how”.

The European Commission should seriously question whether the privileged access enjoyed by companies causing climate change is conflicting with the public interest, and therefore whether the Network should be scrapped.

Box 1: European Science and Technology Network on Unconventional Hydrocarbon Extraction:

Aim: Gather data on first shale gas development in Europe; assess and prioritise the most attractive fracking technology for Europe¹ (NB: a working group chair has publicly stated the aim as creating a friendly attitude towards unconventional fossil fuels)

Management: Joint Research Centre, with guidance from the steering committee (DG Environment; DG Energy; DG Clima; DG Research; DG Internal Market, Industry, Entrepreneurship and SMEs; JRC)

Registered Members:

Currently 74 (Industry, research, European Commission staff, academia, civil society and others)

Working Groups:

- “Exploration, demonstration and production projects in the EU”;
- “Emerging technologies for well stimulation”

Meetings: four per year over three years

Introduction:

For the fossil fuel industry, the shale gas boom in the United States has been presented as a modern-day gold rush. However, the poor environmental record of the shale gas development in North America – because of the use of the inherently destructive² extraction technique called high-volume horizontal hydraulic fracturing, or “fracking” – has seriously tarnished the image of this industry. This is why unprecedented grass roots public opposition in Europe,³ from France and Bulgaria to Spain and Romania, has stopped the fracking industry in its tracks, with many countries introducing bans and moratoriums.

A 2013 European barometer survey found that 74% of Europeans would be concerned if a shale gas project came to their area, while only 9% of Europeans think that unconventional fossil fuel production should be prioritised.⁴ When running for the position, President of the European Commission Jean-Claude Juncker publicly stated, “*I am not in favour of fracking, because we do not know about the real consequences*”.⁵ However, concerted lobbying from the shale gas industry – arguing that stronger legislation would be unnecessary and could discourage investments in Europe – succeeded in trumping public concerns by seriously watering down European-level fracking policies.⁶ The European Commission subsequently presented a non-binding recommendation to member states instead of binding legislation.⁷

The creation of the new *European Science and Technology Network on Unconventional Hydrocarbon Extraction*, or the ‘Network’, is the latest example of the European Commission placing the fossil fuel industry firmly in the driving seat when it comes to shale gas extraction and our energy future (see Box 2).

The ‘Network’:

According to one of the Network’s five chairs, Grzegorz Pieńkowski from the Polish Geological Institute, “*the establishment of the Advisory group [or Network] is a step in reversing the course of an unfavourable or suspicious attitude regarding shale gas, to a more pragmatic and, ultimately, friendly one*”, while hoping the group can “*persuade the European Union that the much needed production of these indigenous resources would be a commercial success*”.⁸

Box 2: Joint Research Centre and the fracking industry plotting to push shale gas

The mission of the Joint Research Centre (JRC) is “*to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle*”.⁹ While producing numerous studies on fracking,¹⁰ its close working relationship with industry places a question mark over its ability to remain independent regarding fracking, particularly given the process leading to the establishment of the European Science and Technology Network on Unconventional Hydrocarbon Extraction.

The idea first arose during an industry-friendly workshop organised with DG Energy, called “*Safe and Efficient Shale Gas Exploration and Production*”,¹¹ with most participants representing major industry players including ExxonMobil, International Oil and Gas Producers (IOGP), Chevron, Talisman Energy, XTO Energy, Statoil, GDF Suez as well as several academics and national authorities with pro-fracking agendas. Civil society was not included. As well as aiming to identify the best available technologies for shale gas development, the workshop also aimed to look at “*the interest in, and viability of a European Platform or Network for Shale Gas Development*”, clearly outlining their intention to promote fracking on the continent. The Network was subsequently developed over the following year and a half, yet civil society was only made aware in June 2014.

The 2014-2015 work programme for the JRC has a strong strand linked to fracking and fossil fuels. One project describes how “*unconventional hydrocarbons are a potential resource contributing to EU energy supply security and economic growth. Work is aimed at identifying resources and reserves; understanding technologies and market impacts, and reducing risk and cost in order to improve EU security of supply*”.¹²

These projects, the opposite to what Europe should be doing to fight climate change, are to be conducted with industry. Numerous oil and gas companies listed among the ‘external beneficiaries’ (ExxonMobil, Total, Statoil, BP, Gaz de France, IOGP, Enel) as well as universities with strong links with the fracking industry (University College London, Delft University of Technology, Gdansk University of Technology, Oil and Gas Institute in Krakow, Wroclaw University of Technology, Yale University - University of Mining and Metallurgy).

The Network, managed by the Joint Research Centre (JRC) but overseen jointly with numerous European Commission departments (DG Environment; DG Energy; DG Clima; DG Research; DG Internal Market, Industry, Entrepreneurship and SMEs - see Box 1), was officially launched in July 2014¹³, with the first meeting in February 2015.¹⁴ Its focus is on assessing on-going projects (exploration, demonstration or production), as well as identifying which technologies would be suitable for use in the European Union¹⁵, i.e. expanding the use of fracking in Europe, despite public opposition. Officially it aims at “*bringing together all relevant stakeholders (practitioners from industry, research, academia as well as civil society) to foster a common understanding*”¹⁶ but a further look reveals the Network as a Commission-funded lobby vehicle driven by the fracking industry that ensures expansion across Europe. The question debated within this Network is therefore not ‘if’ fracking should take place in Europe but ‘how’.

I. **Unfair and unbalanced: industry-captured platform working on making shale gas production more acceptable**

A. Another industry-dominated initiative

Industry domination of the Network is a clear breach of its own guidelines, which aim at ensuring a “*fair and balanced exchange of ideas*”¹⁷ and a common understanding on the impacts of fracking. However, of the non-European Commission members, **fewer than 10% represent civil society, while 40% work directly for the fracking industry** – Shell, Total, ExxonMobil, GDF Suez, PGNiG, Encana and Cuadrilla – which has a large financial stake in fracking continuing in Europe, and has been lobbying for its expansion. Cuadrilla, which also chairs a working group, holds ten exploration licences in the UK, while PGNiG has most of Poland's equivalent licences.¹⁸

Total, France's biggest oil and gas company, has recently been investing massively in unconventional fossil fuels around the world, including Argentina, Bolivia, the United States, Algeria, Denmark and China. The advisory Network also includes several industry lobby groups like the International Association of Oil and Gas Producers (IOGP), Shale Gas Europe and the Union Française des Industries Pétrolières (UFIP).

In addition, 45% of Network members represent academic and research institutes, of which **two-thirds have worked closely with the fracking industry**. For example, Susan Sakmar from the University of Houston started her professional career with Chevron and as an academic speaks at multiple industry conferences promoting shale gas, including on topics such as “*How do you overcome public concerns [over shale gas]?*”¹⁹ Similarly, Nicolae Anastasiu (University of Bucharest), Stanislas Nagy (Krakow AGH University of Science and Technology) and Juan Llamas (Polytechnic University of Madrid) all collaborate with lobby platform Shale Gas Europe.²⁰ Other members include pro-fracking national scientific bodies, such as the Polish Geological Institute, while many lesser-known industry players, consultancies and national-level lobby groups are also in the advisory Network.²¹

B. Pro-fracking chairs

As Box 3 shows (see below), the identity of the chairs also undermines the European Commission's attempt at a “*fair and balanced exchange of ideas*”. The five individuals (three for the working group 1 and two for the working group 2), presented at the first Network meeting in February 2015, were hand-picked by the European Commission steering group and either work for the fracking industry (Cuadrilla, ConocoPhillips), are from a pro-fracking government (UK and Poland) or a fracking industry-friendly body (IFP Energies Nouvelles²²). This puts the fracking industry firmly in the driving seat, particularly when they have been mandated to “summarize, harmonize and approve” the working groups’ output²³.

Box 3: Working group chairs – all pro-industry

Eric Vaughan, Cuadrilla Resources:²⁴ Oil and gas company aggressively pushing fracking in the UK, with licences for ten sites already, and strong links with the UK government²⁵.

Malcolm Rice-Jones, ConocoPhillips:²⁶ Third largest integrated energy company in the US, with around one third of production coming from unconventional sources. It has invested billions of dollars into fracking in the US²⁷ and is increasingly looking abroad (Canada, Colombia²⁸, Poland²⁹ and China³⁰).

Alwyn Hart, UK Environment Agency:³¹ The UK Environment Agency has been crucial in helping the UK government push its pro-fracking agenda by downplaying the associated environmental risks.³² Its current chair has had corporate links to Cuadrilla³³.

Grzegorz Pieńkowski, Polish Geological Institute:³⁴ involved in several research projects related to shale gas extraction.³⁵ He is a known proponent of the fracking industry and in a recent interview with a gas industry journal stated that regulators “*should not overdo it with these [environmental] concerns and impose new burdens that unnecessarily increase costs*” and wants the group “*to demonstrate the absence of environmental risks greater than those that appear in the case of conventional hydrocarbon exploitation.*”³⁶

François Kalaydjian, Institute Français du Pétrole et des Energies Nouvelles (IFPEN):³⁷ French public research body with tight links to the energy industry³⁸, including fracking proponents Total and Repsol.³⁹ Despite the national moratorium in France, IFPEN has linked with public authorities and the private sector (oil and gas industry) to campaign for shale gas exploration.⁴⁰ François Kalaydjian is also a regular contributor on the website of the industry lobby platform, Shale Gas Europe.⁴¹

C. Unfit for an objective view on fracking safety

Most concerning for a group addressing issues of public safety is that many of its members – including some of the chairs – have actively lobbied against tougher safety measures in the past. The state-owned Polish gas company PGNIG (which has two members in the Network), sent its 6.7 million bill-paying customers information claiming fracking “was safe for people and the environment” and urged them to fill out the European Commission’s public consultation accordingly.⁴² It also set-up a fake pro-fracking citizens’ group to lobby against safety regulations at the European level.⁴³

Network members have also been weakening fracking safety measures through their industry lobby groups. One of Brussels’ most influential industry lobbies, BusinessEurope (which includes Network members Total, Shell, ExxonMobil, GDF Suez in its ‘Corporate Advisory and Support Group’), successfully lobbied against environmental impact assessments for fracking exploration⁴⁴. It also argued that while shale gas should be explored in a “sustainable way”, impacts on climate and biodiversity should be ignored in environmental reporting due to “costs and time impact”.⁴⁵ The International Oil and Gas Producers Association, or IOGP (incl. Total, Shell, ExxonMobil, GDF Suez, ConocoPhillips) pushed the European Commission to limit its definition of fracking⁴⁶ – and therefore the focus of safety assessments – to the actual ‘hydraulic fracturing’ of the rocks itself, and not the often-highly polluting upstream and downstream activities.⁴⁷ It also lobbied DG Environment to ignore its own safety findings. Shale Gas Europe (Incl. Total, Shell, and Cuadrilla) has published factsheets on the safety of fracking which affirm that “*it can be conclusively demonstrated that none of the claims of environmental harm commonly levelled against hydraulic fracturing stand up to close scrutiny*”⁴⁸, despite hundreds of independent peer-reviewed scientific reports indicating otherwise.⁴⁹

Many academics and research groups in the Network have been equally involved in presenting a ‘safe’ image for fracking, such as Stefan Ladage⁵⁰ at the Federal Institute for Geosciences and Natural Resources in Germany. The Institute states that “*the risks of fracking in the underground is low*” and that public concern “*is largely unfounded*”.⁵¹

Grzegorz Pieńkowski, a member of the Polish Geological Institute and chair of a working group, stated that “*the environmental risks associated with hydraulic fracturing presented on social media is greatly exaggerated or even completely off the mark*”. The UK government pressed a similar point when writing to previous European Commission President Jose Manuel Barroso⁵². But the pro-fracking bias can also be found within the European Commission itself. DG Internal Market, Industry, Entrepreneurship and SMEs (previously DG Enterprise and Industry) has been a strong proponent of fracking. Its representative in the advisory Network claims shale gas is “*cleaner than other fossil fuels*”⁵³ despite academic studies showing carbon emissions to be comparable to coal.⁵⁴ DG Energy has also shown its intentions, consulting almost exclusively with industry on the topic of fracking, despite receiving many concerned letters from citizens.⁵⁵

In short, the European Commission is putting the assessments of a highly damaging and polluting technology in the hands of a group where the majority of members have a clear financial stake in the expansion of fracking (including technology patents⁵⁶). This is despite the fact that many of them have been exposed as aggressively lobbying for weaker safety rules. Such a blatant conflict of interest is not just jeopardising public safety and the

environment, but also citizens' faith in the European Commission being able to put their interests before industry profit.

D. The European Commission gets behind the fracking industry

When challenged by civil society regarding the obvious domination by the shale gas industry and its proponents, the JRC denied there was a problem, and said they “*see no need to change the rules and structure of the working groups or the chairs*”. Ignoring the industry domination, they said the European Commission was “committed to not limiting the participation” of any stakeholder that met the criteria, and that the group was “*open to all interested parties*”. To address the lack of civil society participation, the JRC offered to “support about 40–50 trips, depending on their costs”, which would correspond to the expenses needed for three to four civil society participants if they wanted to attend the four meetings planned per year of this three-year project. This would fall far short of balancing the panel but underlines the huge imbalance between industry and civil society resources, a structural problem leading to industry domination across the European Commission's advisory system (see Box 4).

E. JRC says industry dominance no problem, as Network won't advise

To deal with systemic industry dominance across the European Commission's advisory bodies (formally known as 'Expert Groups'), the European Ombudsman recommended that all groups should be balanced (see Box 4). But when confronted with this, the JRC responded that the Network “*does not have an advisory role*” as it “*only gathers, analyses and reviews information*”. This is deeply questionable, as according to the official programme of Working Group II, “*Emerging Technologies for Well Stimulation*”, the task is not just to analyse current technologies but to provide a “prioritization of the most attractive” ones.⁵⁷ Additionally, the working group chair Grzegorz Pieńkowski has repeatedly and publicly called it “*an advisory body*”, stating its role is to “*advise the European Commission in the field of non-conventional hydrocarbons*”, and adds that “*the European Commission will base its future political decisions and regulations on the work of the advisory group*”.⁵⁸ As such, civil society groups have argued that it should follow the same rules that apply to other advisory groups.⁵⁹

Box 4: Industry domination across the advisory system – Ombudsman taking action

The European Commission relies on external advice when forming policy, normally in the form of advisory groups, formally called 'Expert Groups'. Unfortunately the most politically and economically important groups, such as those on banking, tax, climate or defence, have been dominated by industry, with massive under-representation of trade unions, consumer groups or NGOs.⁶⁰ The situation became so bad that the European Parliament twice voted to freeze the European Commission's budget on Expert Groups.⁶¹ Following her own investigation, European Ombudsman Emily O'Reilly has recommended that the European Commission introduces a legally-binding framework that covers all Expert Groups and 'similar entities' to tackle the “*imbalance in favour of corporate interests in certain groups and potential conflicts of interest of experts*”,⁶² evidenced further by this Network. The European Commission has been given until April 30th to respond to the recommendations.

Conclusions:

The domination of *the European Science and Technology Network on Unconventional Hydrocarbon Extraction* by pro-fracking industry members, governments and academics is part of a wider push by industry to go ahead with fracking despite clear public rejection. If the Network's intended goal is to objectively assess the safety of fracking and relevant technologies, then the inclusion of many members with strong financial and professional stakes in the expansion of fracking has ensured this will never happen. Those selected to chair the working groups either have a track record of lobbying against stronger safety assessments and public interest regulation or have been involved in promoting shale gas development.

Industry's dominance of the Network is not an isolated incident, but another clear sign of the increasingly close relationship between the European Commission and the most polluting industries, particularly through its advisory system. The European Ombudsman is tackling the problem head-on and has already published recommendations, but now it is up to the European Commission to act and end the privileged access industry currently enjoys (See Box 4).

The European Union is becoming increasingly vocal about its climate ambitions as we approach the UN climate talks in Paris this December. However, this research provides yet another example of how the European Commission agenda is shaped and driven by dirty energy companies rather than citizens and the public interest. Given the damage that is being done – to public confidence and the climate – the European Commission should seriously question whether the privileged access enjoyed by companies causing climate change is conflicting with the public interest, and therefore whether the Network should be scrapped.

Annex I – List of registered members of the Network

First Name	Last Name	Organisation/Company	Position
Indrek	AARNA	Eesti Energia	Head of R&D Department
DAVID	ALAMEDA	ShaleGas España	Director General ShaleGas España
Eloy	ALVAREZ PELEGRY	Orkestra-Basque Institute of Competitiveness	Head of the Energy Chair
Nicolae	ANASTASIU	Faculty of Geology and Geophysics at the University of Bucharest	Professor Emeritus specialising in Sedimentology, Sedimentary Petrography
Anton	ANTONENKO	Ukrainian Energy UA-Energy.org	Project manager
Andrew	BARNES	SRK Consulting	Geochemist
Cesar	BARON	Chicago Bridge & Iron Company N.V.	Civil & Structural Engineer
Benjamin	BRIERE DE L'ISLE	WRC Plc	Hydrogeologist
Philippe	CHARLEZ	Total	Mining Engineer
Mark	COTTRELL	Golder Associates	Senior Engineer
Lorenzo	CREMONESE	IASS Potsdam	Project Scientist
Jarno	DAKHORST	NEN	Consultant
Geert	DECOCK	Food & Water Europe	Director of EU Affairs
Anne-Marie	DELMOTTE	Laboratories of Ministry of Defense (BE)	Multilingual Administrator and Translator
Anna	DRAZEK	Pomorskie Regional EU Office	Director
Mikael	DUMEUNIER	Union Française des Industries Pétrolières	Directeur Exploration et Production
Peter	EASTON	Easton Consult	Environment and Water Resources Consultant
Arne	ERIKSSON	European Commission - DG Energy	Policy Officer with responsibility for Unconventional Hydrocarbons
Darrick	EVENSEN	Oberlin College	Environmental sociologist
Ida Lykke	FABRICIUS	Technical University of Denmark	Professor of petroleum engineering geology
vicki	FLEETWOOD	Encana Corporation	Completions Advisor
David	FORSTER	UK Environment Agency	Strategy manager
Luca	GANDOSSI	European Commission - JRC	Researcher
Gerda	GOUWENS	European Commission - JRC	Civil servant
Alexander	GUSEV	IASS Potsdam	Project Scientist
Alwyn	HART	UK Environment Agency	Theme Expert Air, Land and Water
Liam	HERRINGSHAW	Durham University	Post-Doctoral Research Associate in the Department of Earth Sciences

Travis	HESKETH	Emerson Process Management	Vice President
Mike	HILL	Gemini Control	Chartered Electrical Engineer
Alexandr	JEVSEJENKO	European Commission - DG Clima	Policy Officer for Low Carbon Technologies
Francois	KALAYDJIAN	IFP Energies Nouvelles	Directeur des Technologies de Développement durable
Kärg	KAMA	St Anne's College	Research and Teaching Fellow
Cristian	KANOVITS	European Commission - DG Enterprise and Industry	Energy and Transport Policy Officer
Vassilios	KOUGIONAS	European Commission - DG Research and Innovation	Research Programme Manager
Ewa	KUBALA	PGNiG	EU Affairs Specialist
Stefan	LADAGE	Federal Institute for Geosciences and Natural Resources (Germany)	Researcher
Florence	LIMET	European Commission - DG Environment	Socio-Economic Analyst - Impact assessment, socio-economic assessments
Juan	LLAMAS	Polytechnic University of Madrid (UPM)	Mining Engineer
Xavier	MAASARANI	Shell	Senior Manager EU Regulatory Affairs
florence	MAISEL	INTEREL France	Directeur général
Marcelo	MASERA	European Commission - JRC	Head of Unit "Energy Security, Systems and Market"
Juan Carlos	MUÑOZ-CONDE	Focus New Energy Group	Social Director
Stanislaw	NAGY	AGH University of Science and Technology, Krakow	Professor of Thermodynamics and Natural Gas Engineering
Maria	OLTEANU	No Fracking Romani	Environmental and human rights activist
Peter	PETROV	European Commission - DG Research and Innovation	Project Officer - Carbon Capture and Storage
Dima	PETROVA	European Commission - JRC	Energy Security, Systems and Market Unit
Ana	PICADO	Laboratório Nacional de Energia e Geologia (Portugal)	Researcher in Ecotoxicology
Grzegorz	PIENKOWSKI	Polish Geological Institute	Professor
Daria	PIRVU	Agora for life	Romanian anti-fracking activist
Mihaela	POPESCU	Agora for life	Romanian anti-fracking activist
Audrey	QUEHEN	GDF Suez	Chargé de mission/communication
Christine	RAVNHOLT HARTMANN	International Association of Oil and Gas Producers	EU Affairs Manager
Benito	REIG	1312 agua y recursos S.L	Civil, Channels and Ports Engineer
Leonie	REINS	Milieu Ltd	Legal researcher
Boleslaw	REY	PGNiG	Head of the Office of Science and Research Development
Susan	SAKMAR	University of Houston	Researcher
Yvonne	SCHAVEMAKER	TNO Energy	Business Developer

Jean-Louis	SCHILANSKY	Union française des industries pétrolières	Director
Michael	SCHUETZ	European Commission - DG Energy	Unit C2 New energy technologies, innovation and clean coal
Brian	SEABROOK	Exxon Mobil	Engineer
Morten Kanne	SOERENSEN	Technical University of Denmark	Phd student
Tamara	STEGER	Central European University	Associate Professor
Reiner	STOLLBERG	Helmholtz-Zentrum für Umweltforschung	Department of Groundwater Remediation
Liutauras	STOŠKUS	Corporate Social Responsibility Network of Lithuania	Chief adviser
Steve	THOMPSETT	United Kingdom Onshore Operators Group (UKOOG)	Executive
Pickard	TREPESS	FracPT FZE	Managing Director
Serge	VAN GESSEL	TNO	Petroleum geologist and Project manager
Eric	VAUGHAN	Cuadrilla Resources Ltd	Well Services Director
Juan Cruz	VICUÑA IRUSTA	Sociedad de Hidrocarburos de Euskadi, S.A.	Director General
Ulrik	VON ESTORFF	European Commission - JRC	Technical Project Manager - Scientific officer
Shlomo	WALD	European Commission - JRC	Chief Scientist
Werner	WEINDORF	Ludwig-Bölkow-Systemtechnik GmbH	Scientist
Keith	WHIRISKEY	Bellona	Policy Manager Climate Technologies
Christian	WIMMER	European Commission - DG Environment	Socio-Economic Analyst - Impact assessment, socio-economic assessments

- 1 <https://cloud.foeeurope.org/index.php/s/SU6ZTyfS8zYTBeL> <https://cloud.foeeurope.org/index.php/s/rIDyOSII9tvQkH4>
- 2 <http://concernedhealthny.org/wp-content/uploads/2014/07/CHPNY-Fracking-Compendium.pdf>
- 3 In June 2013, the results weighted by population of the European public consultation organised by the European Commission showed that 64% of participants think shale gas "should not be developed in Europe at all" and that 20% think it "should be developed in Europe only if proper health and environmental safeguards are in place" http://ec.europa.eu/environment/integration/energy/pdf/Shale%20gas%20consultation_report.pdf
- 4 http://ec.europa.eu/public_opinion/archives/flash_arch_360_345_en.htm#360
- 5 <http://euranetplus-inside.eu/big-crunch-presidential-debate-on-april-29/>
- 6 <https://www.foeeurope.org/fracking-brussels-240714>
- 7 http://www.foeeurope.org/shale_gas_framework_220114
- 8 <http://gazlupkowy.pl/pienkowski-komisja-europejska-zmienia-zdanie-o-gazie-lupkowym/>
- 9 <https://ec.europa.eu/jrc/en/about>
- 10 See for example <http://publications.jrc.ec.europa.eu/repository/handle/JRC83619>; <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/shale-gas-europe-%E2%80%93-main-environmental-and-social-considerations?search>; <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/unconventional-gas-europe-potential-energy-market-impacts>; <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/assessment-use-substances-hydraulic-fracturing-shale-gas-reservoirs-under-reach?search>; <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/overview-hydraulic-fracturing-and-other-formation-stimulation-technologies-shale-gas?search>
- 11 <https://ec.europa.eu/jrc/sites/default/files/ld-na-25990-en-n.pdf>
- 12 <https://ec.europa.eu/jrc/sites/default/files/mawp-2014-2015.pdf>
- 13 <https://ec.europa.eu/jrc/en/news/launch-european-science-and-technology-network-unconventional-hydrocarbon-extraction>
- 14 <http://www.pqi.gov.pl/en/all-events/5539-pierwsze-spotkanie-grupy-roboczej-european-science-and-technology-network-on-unconventional-hydrocarbon-extraction.html>
- 15 <https://cloud.foeeurope.org/index.php/s/SU6ZTyfS8zYTBeL> <https://cloud.foeeurope.org/index.php/s/rIDyOSII9tvQkH4>
- 16 https://ec.europa.eu/jrc/sites/default/files/Mandate_and_ROP_attached_to_note_to_JS.PDF
- 17 <https://ec.europa.eu/jrc/en/news/launch-european-science-and-technology-network-unconventional-hydrocarbon-extraction>
- 18 <http://polishshalegas.pl/en/shales-in-poland/pgnig-licenses/map-of-concessions>
- 19 <http://www.law.uh.edu/faculty/cv/SusanSakmar.pdf>
- 20 <http://www.shalegas-europe.eu/professor-nicolae-anastasiu/>
- 21 Behind the usual suspects, many other participants represent more obscure companies (Eesti Energy, Chicago Bridge & Iron Company N.V., Emerson Process Management, FracPT FZE, Sociedad de Hidrocarburos de Euskadi), research firms (TNO, IASS Potsdam, Easton Consult), consultant agencies (Golder Associates, NEN, Focus New Energy Group, 1312 agua y recursos S.L), lobby groups (INTEREL France) and industry coalitions (UFIP, UKOOG, Shale gas Espana). For a full overview, see the online annex
- 22 <http://www.actu-environnement.com/ae/news/gaz-schiste-rapport-montebourg-ofce-revision-calculs-baisse-24310.php4><http://www.actu-environnement.com/ae/news/avis-academie-sciences-recherche-gaz-schiste-ifpen-opepst-20027.php4>
- 23 <https://cloud.foeeurope.org/index.php/s/SU6ZTyfS8zYTBeL> <https://cloud.foeeurope.org/index.php/s/rIDyOSII9tvQkH4>
- 24 <http://www.shale-world.com/2014/01/15/eric-vaughan-well-services-director-cuadrilla-commercialise-develop-uks-resources/>
- 25 Cuadrilla's chairman, Lord John Browne (former Chief executive of BP), was until very recently a non-executive director of David Cameron's Cabinet Office, with a very close working relationship with Minister Francis Maude MP. Cuadrilla's highly-controversial shale gas exploration project in Balcombe is within Maude's Parliamentary constituency.
- 26 <http://www.offshore-europe.co.uk/Conference/2015-Keynote-Committee/Keynote-Chairman-Biography3/>
- 27 <http://www.forbes.com/sites/afontvecchia/2013/04/25/conocophillips-spending-more-than-1-billion-on-u-s-and-colombian-shale-plays/>
- 28 <http://www.forbes.com/sites/afontvecchia/2013/04/25/conocophillips-spending-more-than-1-billion-on-u-s-and-colombian-shale-plays/>
- 29 <http://www.ft.com/cms/s/0/ffa09b60-6036-11e4-98e6-00144feabdc0.htm>
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- 31 <https://www.gov.uk/government/organisations/environment-agency/about/research>
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