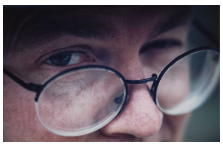
FRACK EU:
UNCONVENTIONAL INTRIGUE IN POLAND

A Preliminary Investigation of the Fracking Assault on Poland



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CHAPTER 3: Exxon Fracks EU First! - Experts' Report

3. EXXON FRACKS EU FIRST! - EXPERTS' REPORT

3-(1). The Science Experts: EU Shale Intel Reports from the AAPG

Every profession has a body, an association, that meets together for fellowship, dialogue, communication - it's how we learn and share intelligence, and gain wisdom and knowledge - for a range and variety of purposes and interests. This is true for the American Association of Petroleum Geologists, "the largest professional association of geoscientists in the world" [1] employed by private industry, government and academia.

The AAPG is divided into an array of regional and sectional groups under three thematic divisions, one being the Energy Minerals Division (EMD). Formed in 1977, the EMD "serves as an international forum for those working in the exploration, development, and production of energy sources other than conventional oil and natural gas."

> *EMD members actively participate in the society by helping to organize or support local society meetings, regional, national or international meetings, symposia, workshops, short courses, and field trips, and by publishing in the AAPG Bulletin, the AAPG EXPLORER, in EMD memoirs and special publications and in the EMD-supported journal, Natural Resources Research, and the DEG journal, Environmental Geosciences. EMD also provides a forum for addressing the sciences involved and in the associated economics involved in developing the commodities to promote the integration of geoscientific knowledge with those in related professions and activities.* [2]

The EMD is divided into six regions or sections within the United States, and six inter-continental regions or sections: Africa, Asia Pacific, Canada, European, Latin America, and Middle East. Under the EMD is a list of three Committees, each with its own group of Committees. Under the **Commodity Committees** section are five Committees: **Unconventional Resources**, Coal, Uranium, Geothermal Energy, and Renewable Energy. They all meet together and share information through reporting with the rest of the professional body.

3-(1a). The 2008 Committee Report

In turn, the Unconventional Resources Committee is divided into six groupings: Coalbed Methane, Gas Hydrates, Gas Shales, Oil (Tar) Sands, Oil Shale, and Tight Gas Sand. Every year these sub-group committees meet and produce a report. Of interest, the **Gas Shales Committee Report of April 19, 2008** has ***no information*** on the European front, which clearly indicates the late nature of deep shale activities in Europe. The report, however, has plenty of information about shale gas activities in the United States and Canada, i.e., the Texas Barnett shales "still the most active gas-shale play in the United States." (It includes a reference link to a document on the Texas Railroad Commission website on the relevant stats and companies operating in the Barnett). The remaining list reporting of shale gas activities in the United States, by State, is absolutely amazing with respect to the sheer number of activities.

[1] AAPG website.
[2] AAPG website, "about EMD".

3-(1b). The 2009 Committee Report

The **November 12, 2009 Gas Shale Committee report**, under Vice-Chairs Brian Cardott, Harris Cander, Michael Cameron, and Neil Fishman, includes a brand new section under item (p), *European Unconventional Shale-Gas Activity.* Its a report by Dan Jarvie with **Worldwide Geochemistry** who was at the Institut Francais du Petrole (France):

> *Gas production in Europe is running about 11 Tcf with 75% of this gas coming from the United Kingdom, Norway and Netherlands. Peak production of 13.5 Tcf was reached in 2003 (Hertzmark, 2009). With natural gas consumption running at 20.5 Tcf in 2008 and with about 80% of the gas coming from Russia, there is a definite need for additional hydrocarbon resource development. Natural gas also has the attraction of reduced emissions as opposed to coal burning particularly in oxides of carbon and nitrogen.*
>
> *Activity in unconventional shale gas has been underway for the last several years, although there has only been drilling activity as of 2009. As has been described elsewhere on numerous occasions,* ***European oil companies have taken an active position in several US shale gas basins****. Those companies include Statoil (Marcellus),* ***British Gas*** *(Haynesville),* ***Shell*** *(Barnett, Haynesville, and others), and* ***ENI*** *(Barnett). Of course* ***BP*** *has also been active in US shale-gas plays.*
>
> *Reserves from shale has been estimated as high as 500 Tcf, but a recent report provides a more conservative but perhaps more realistic estimate that there is at least 230 Tcf in European shale gas systems (Doornenbal et al., 2009).*

Jarvie identified introductory shale gas activities by a small number of petroleum companies in Austria, Denmark, France, Germany, Hungary, Poland, Romania, Switzerland, and the United Kingdom, including a mystery category: "**Park Place Energy Corp.** and **Concessions International** have identified two unidentified European shale gas opportunities. These are described only as in the EU and covering over 100,000 acres of land." Jarvie also briefed the Committee on the recent creation of the **Gas Shales in Europe** project - **GASH**: [3]

> *GASH is an interdisciplinary research project carried out by a multi-national expert task force. It is a 3 year research program and is funded with 7 participating oil companies. Current participants include* ***ExxonMobil****,* ***Gaz de France****,* ***Marathon****,* ***StatoilHydro****,* ***Total****, and* ***Vermilion Energy*** *(Williams, 2009). The project focuses on the potential gas shales of Europe. Importantly, it also integrates proven US gas shales (e.g. Barnett Shale) for calibration of key variables.*
>
> *The GASH project will predict shale gas formation and occurrence in time and space because the geological evolution of gas shales is a key control of economic viability. The distribution of prospective shales will be ascertained using existing and enhanced regional databases.*

[3] Penn Energy's May 29, 2009 web news article, *European shale gas prospects heat up*, that the GASH project began on May 1, 2009, "the first and biggest and most comprehensive study on shale gas in Europe", with a "data base that spans 20 European countries."

Daniel Jarvie

There are a number of biographies on Jarvie, many of which are his own. He is president of **Worldwide Geochemistry LLC**, a consultant to the petroleum industry. Worldwide Geochemistry has its own research lab "to evaluate various aspects of unconventional shale-gas and shale-oil petroleum systems."

When Jarvie wrote the 2009 and 2010 AAPG shale gas committee report segments on Europe, he was on a "one year visiting scientist position at **Institut Francais du Petrole** (IFP) in Rueil-Malmaison, France, where he worked on compositional kinetic modeling with Francoise Behar and shale resource systems in Europe." Jarvie is also active in the **GASH** centre in Germany.

In his numerous presentations, there is consistent reference to his recognition by the AAPG and the petroleum industry on his "ongoing work in unconventional shale-gas exploration, particularly the Barnett Shale of Fort Worth Basin, Texas."

Jarvie is an adjunct professor at the Texas Christian University. He is also an affiliate professor at the University of Oklahoma.

In April 2011, Jarvie was hired by **Tamboran Resources Pty Ltd.**, an "emerging Australian-based global shale gas pioneer" (*World Renowned Organic Shale Geochemist Daniel M. Jarvie Joins Tamboran's Technical Advisory Board*, April 27, 2001, PRWEB). Tamboran has areas and applications of about 31 million acres in Australia, **Ireland**, and Botswana. Jarvie is also on **Realm Energy International**'s Technical Advisory Board.

In 2010, Jarvie was presented with **Hart Energy's** "most influential people in the next decade for the petroleum industry" award. (Hart Energy's website states that it is "one of the world's largest energy industry publishers, with a diverse array of informational products and services," and "recognized for its expert coverage of the global energy industry through its highly respected, award-winning magazines, newsletters and directories, conferences, consulting services and online resources.")

o

GASH is no ivory tower research marathon. It is goal-orientated and designed to meet the longer-term needs of both sponsors and researchers alike. The GASH team is mainly European, but with the right mixture of American-based experience and know-how. The project is coordinated by ***GeoForschungsZentrum Potsdam*** *(GFZ), the national laboratory for geosciences in Germany. Working alongside them are the* ***Institut Français du Pétrole*** *(France) and* ***TNO*** *(The Netherlands). The universities involved to date include Newcastle (UK), Aachen, FU Berlin, Clausthal, Leipzig (all Germany), VU Amsterdam (The Netherlands) and MU Leoben (Austria). National and state geological surveys play a key central role not only in regional analysis and application, but also in basic research.*

GeoEn. *GeoEn is funded by the German ministry for research and education. This is a six year project that will include black shales in Brandenburg and Mecklenburg-Vorpommern, northern Germany (Williams, 2009).*

Core Laboratories. *Core Laboratories'* ***Integrated Reservoir Solutions Division*** *has been conducting a joint industry project for the past 4 years focused on reservoir characterization and completion/stimulation of Gas Shales in North America (****Phase 1****). Over 65 member companies are contributing conventional core, well logs, completion, stimulation, and*

production data for a total of 195 wells to date.... All of these data and interpretations are provided in a web-enabled Oracle database to the member companies and presented at periodic core workshops and technical seminars.

Core Laboratories is expanding our industry-leading study of Gas Shales to areas outside of North America as a ***Phase 2*** *to our original study. Participants in the* ***Phase 2 Study*** *will receive all of the data and interpretations from the* ***North American Phase 1 Study*** *and will contribute core and data from their own Gas Shale reservoirs.* ***The initial focus of the project is on European Basins from Ireland to the Ukraine.*** *Participants will be able to leverage the North American data sets and technology in evaluating and developing their own Gas Shale reservoirs. These integrated data sets and case histories will provide operators with the critical parameters to optimize their exploitation of these reservoirs and reduce finding and development costs..... The project will be focused on utilizing the experience of evaluating numerous North American gas shale wells in* ***expanding the evaluation of gas shale reservoirs globally****.*

The image, *Overview of Known Companies with Unconventional Gas Positions in Europe*, is from Royal Dutch Shell's January 2011 *Memorandum to the United Kingdom's Energy & Climate Change Committee*, Written Evidence, Volume 2, Shale Gas, Fifth Report of Session 2010-12. Shell attempted to impress the Committee on all of the diverse corporate fracking interests in the EU.

Jarvie reported that **ExxonMobil** "has licenses on over 1.3 million acres in the **Lower Saxony Basin**, Germany for potential biogenic and thermogenic shale gas from the Wealden Shale and the Posidonia Shale.... **Shell** is apparently a partner in at least part of this project." **ExxonMobil** was also setting up interests in Hungary (a joint exploration project with **MOL**, and with Exxon's affiliate **Falcon Oil & Gas**) and in Poland (under an agreement with **ConocoPhillips**). **Shell** had just set up shop in Sweden.

Of all early-stage EU operations, Jarvie's summary of activities in Poland was the longest:

> *There has been considerable activity for partnerships and concessions in Poland in the past year, although lesser known efforts were occurring earlier.* ***ExxonMobil*** *and* ***ConocoPhillips*** *signed separate deals on exploration acreage in Poland.*
>
> ***3Legs Resources*** *and its subsidiary,* ***Lane Energy Poland****, acquired licenses on over 1 million acres in the Baltic Basin with prospective shale gas systems. A significant portion of their acreage has been packaged into agreement with ConocoPhillips, and ExxonMobil.*
>
> *An* ***ExxonMobil affiliate*** *has obtained exploration acreage in the Podlasie and Lublin basins in Poland (Patrick McGinn, ExxonMobil spokesperson, October 13, 2009). The acreage position was not disclosed but it was acquired in December 2008.*
>
> ***ConocoPhillips*** *has reached an agreement with* ***Lane Energy*** *targeting Silurian shales in northern Poland's Baltic Basin. They have options on an additional 1 million acres in three areas of Poland.*
>
> ***BNK Petroleum*** *has an agreement with Rohol-Aufsuchungs Aktiengesellschaft (RAG) and Sorgenia E&P S.p.A to farm out an 80% interest in three oil and gas concessions in the Gandsk Basin, identified as Starogard, Slupsk, and Slawno, covering 700,000 gross acres. BNK will receive a management fee and the work necessary to identify the first drilling location. BNK has identified characteristics compatible with successful shale gas plays such as good organic richness, thermal maturity in the gas window, and silica-rich mineralogy.*

3-(1c). The 2010 Committee Report

Five months later, the **EMD Gas Shale Committee** produced another report on **April 10, 2010** for the EMD Annual Leadership Meeting. Under section 1(s) *European Unconventional Shale Resource Play Activity*, Dan Jarvie provided another update:

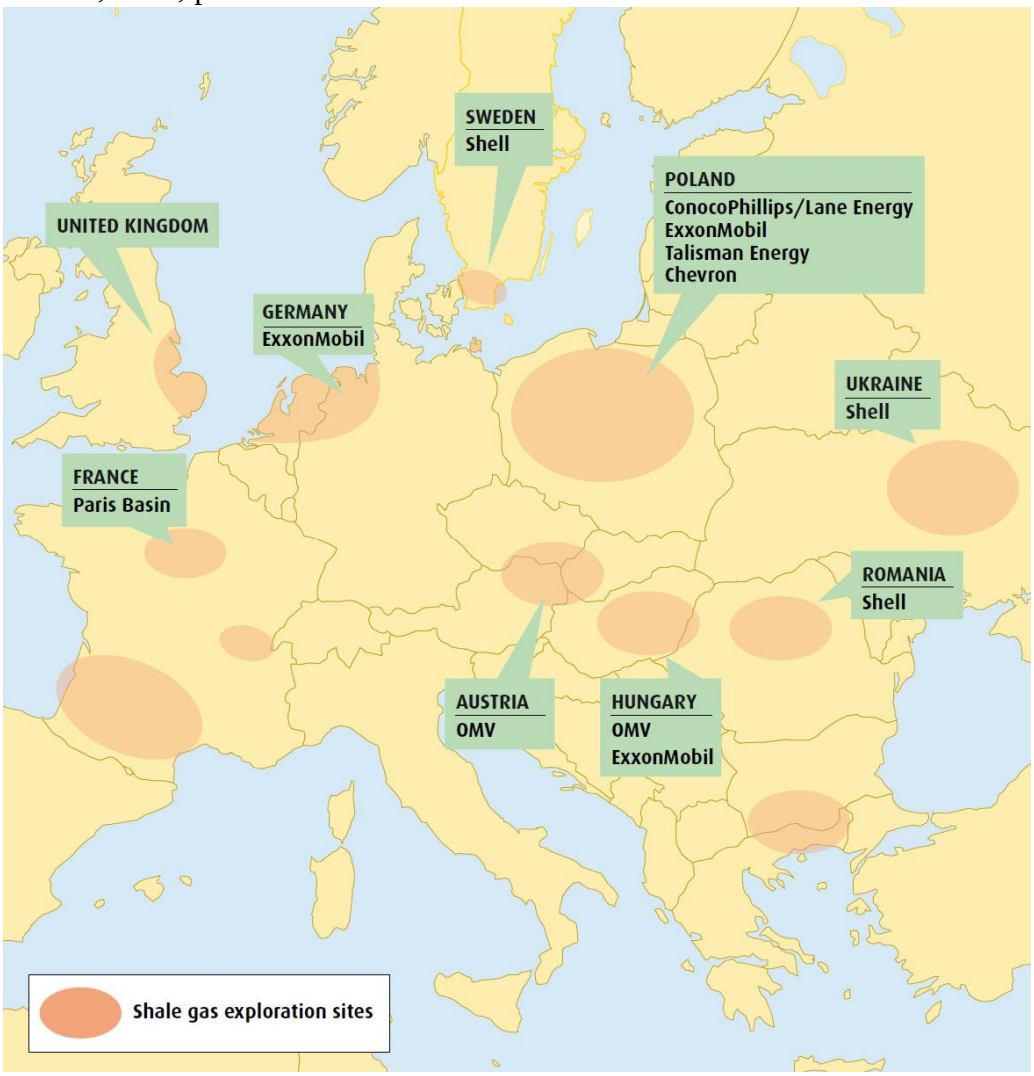
> *Activity in Europe has increased dramatically with extensive acreage positions being staked by a number of international independents.* ***Of course the US Majors have contributed to the push here*** *making their own deals or partnerships with groups that have leasehold positions. As reported previously,* ***ExxonMobil*** *and* ***Shell*** *are active individually and as partnerships in Germany and Sweden.* ***ConocoPhillips****,* ***Chevron****, and* ***Marathon*** *have also staked positions with the most notable to date being in Poland.*
>
> *Almost all of the activity has been for shale-gas resources with little consideration of shale-oil, although Toreador Resources has shown shale-oil prospectivity in the Paris Basin.*

Limitations for doing business in Europe are worth noting in addition to an environmental persona comparable to New York or California. Costs are certainly higher due to limited rigs and services. The limited drilling activity to date has constrained the availability of services as it is difficult to establish a critical mass of business activity at this point in European shale resource plays.

Once discoveries are announced, and they will be forthcoming, drilling activity will increase rapidly but not likely until 2011-2012. At such time the limited number of rigs available for drilling in Europe will continue to be an issue. At the present time it is my understanding that there are about 50 rigs available in all of Europe.

An excellent and as comprehensive review of European shale resource potential was reported in E&P by Ken Chew of IHS. Readers are referred to this article dated March 1, 2010 as it was a major source of information for this report.

Chew, K., 2010, *The shale frenzy comes to Europe*: Hart Energy Publishing, E&P, v. 83, no. 3, p. 35-39.



This map of company activities in Europe was originally presented by London-based **Gas Strategies** on November 8, 2010 at an EAGC pre-conference workshop, *The Prospects for Shale Gas in Europe* ....

For the second year in a row, Jarvie's AAPG's shale committee intel on Poland was the longest:

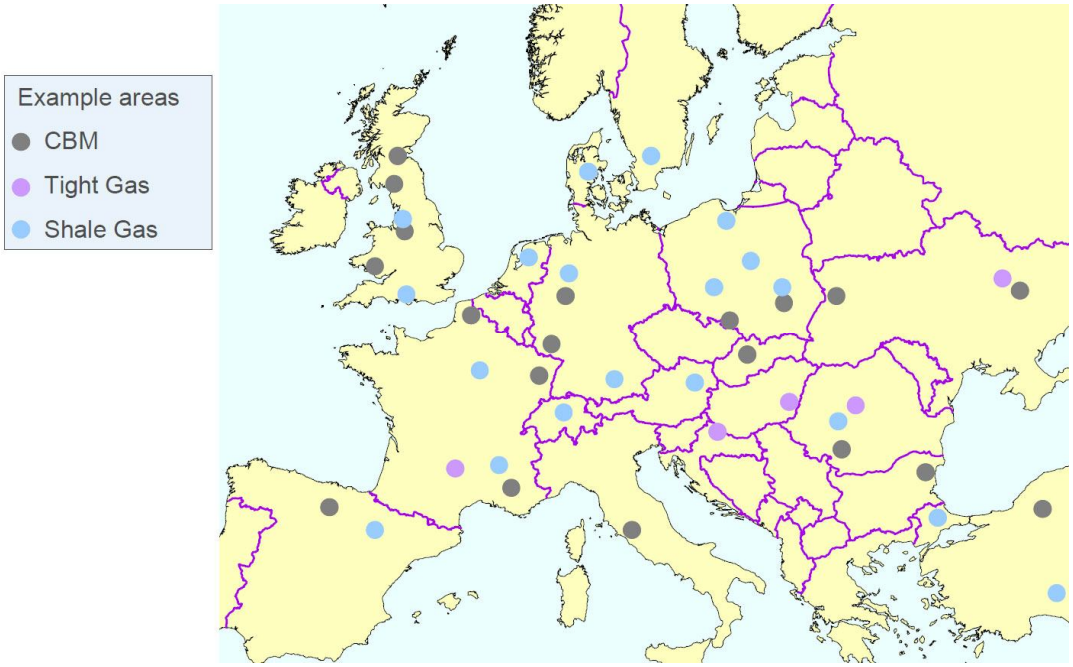
The total number of concessions granted in Poland for shale-gas potential now totals 30 according to Reuters news service. Poland has very favorable fiscal terms for E&P with royalties less than 5% and corporate tax rate of 19%.

*It is expected that **Lane Energy** will operate the first well to test the L. Paleozoic in Poland (Chew, 2010). The well will be located in the Gdansk Depression with funding provided by **ConocoPhillips** with targets in the Silurian and Ordovician (Chew, 2010).*

***Talisman Energy** has announced a joint venture with **San Leon Energy subsidiary**, **Oculis Investments SP**, for exploration for shale gas in the Baltic Basin onshore Poland (O&GJ, Jan. 29, 2010). As such Talisman has paid Oculis 1.5 million euros and will pay 60% of the cost for a seismic program. Talisman will drill one well in each of Oculis' three concessions with an additional three wells if initial well results are encouraging. Talisman will have a 60% interest in each concession; however, this would be reduced to 30% if Talisman does not drill the optional wells (Scandinavian Oil-Gas Magazine, March 4, 2010).*

***Chevron Polska E&P** has been granted a concession in southeastern Poland near the city of Zamosc. Under the terms of the concession, they will have 5 years to explore shale gas opportunities in the area covering ca. 800 sq km. It is reported that Chevron only expects to assess the possibility of developing this into a shale gas field.*

*A range of companies have acquired concessions in Poland. According to O&G Journal (Jan. 29, 2010), **Marathon** has acquired interests in Poland. Others such as **LNG Energy** have three concession areas in Poland totaling 88,000 acres with focus on Silurian and Ordovician shales. **EurEnergy** has also obtained concessions in Poland (Reuters). **BNK** has also obtained concessions in Poland for 720,000 acres.*



However, not everyone in the petroleum industry was convinced of the "shale gas hype":

> *For months, the shale gas hype has been spreading across Europe, with newspapers blasting headlines over how new supplies will help the continent cut its dependence of Russian gas, fight climate change, and reclaim its security of supply. But here's the reality: shale gas is unlikely to change Europe's energy equation of falling indigenous gas production and rising demand. And if it does cause changes, those changes are unlikely to occur for at least a decade, if at all.*
>
> *"There's a lot of potential, but we are not quite at the point where this is going to change landscape on European gas," said Nikos Tsafos, head European gas analyst with* ***PFC Energy****, the Washington-based energy consultancy. "People recognize that this is big, but they don't recognize what it will take to get there. People are talking about unconventional gas as a panacea for Europe without necessarily understating what needs to happen. And the gap between reality and expectations worries me."*
>
> *While only in the early exploratory phase, companies are racing to secure acreage in Sweden, Poland, Germany, Hungary, Austria, France, and the UK to determine whether North America's success in developing unconventional gas resources can be replicated. The shale gas fever involves the likes of Shell, OMV, BNK Petroleum, ConocoPhillips, and Exxon Mobil. But it's going to take at least another five years just to complete the most comprehensive review of Europe's shale gas potential that only began earlier this year. Gas Shales in Europe, as the program is known, is spearheaded by* ***GeoForschungsZentrum*** *(GFZ), the German research center for geosciences in Potsdam, and financed by Exxon, Marathon Oil, StatoilHydro, GdFSuez, Vermilion, Total, and a new, but still* ***confidential sponsor****.*
>
> *Even assuming bigger quantities of shale gas in Europe, with outdated studies estimating more than 500 trillion cubic feet, there are huge geological differences with the US. Experts don't expect shale formations here to have nearly as much gas trapped in them as North America ones. It is unlikely to be as profitable as the gas plays are probably smaller in size and have more rapid decline rates.*
>
> *And that's without compounding a myriad of other challenges, including population density, water shortages, insufficient infrastructure, overregulation, environmental policies, and technological uncertainty.*
>
> *But even if there is little action in Europe, its companies are no longer standing idle. BG, Eni, and StatoilHydro, among others, are getting in on the shale gas action in the US and starting to explore other continents. Their goal is to capture some of the game-changing action the IEA believes shale gas will bring globally.*
>
> *Europe will take its time. "There are still some codes that can't be cracked," Tsafos said. "In Europe, you'll need a lot more activity before trial and error produces the same results as in the US." The environmental impact, including water use, roads, and pipelines, will also be contentious due to Eu*rope's higher population density.
> (*Europe and Shale Gas, Lots of Unanswered Questions*, **Energy Tribune**, November 17, 2009)