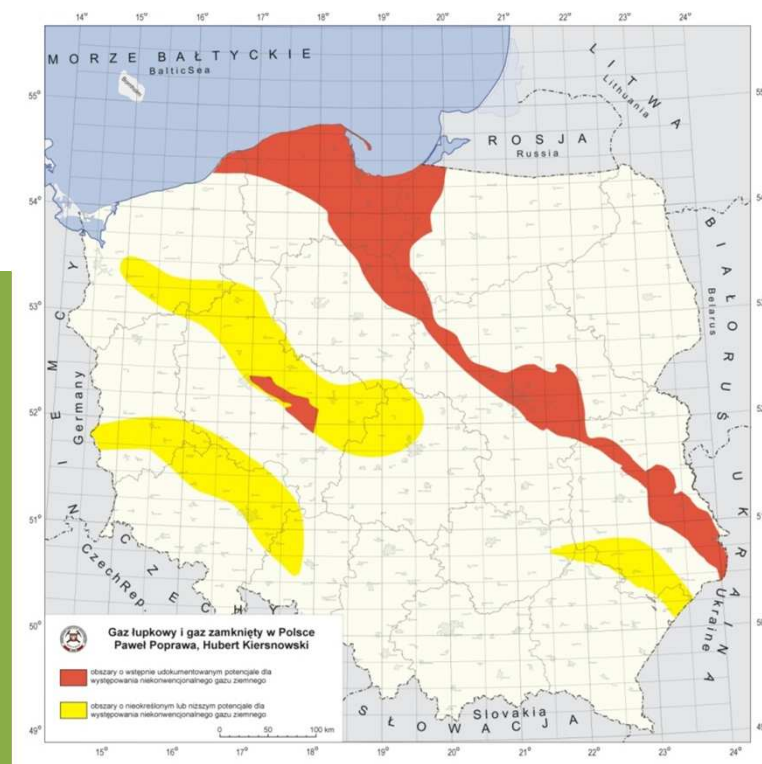




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SHALE GAS IN POLAND

Piotr Grzegorz Wozniak
Chief National Geologist of Poland

7-8-9 March 2012



Legal Framework

» National level:

- Geological and Mining Law with its Sub - Regulations (Act of 9 June 2011)
- Act on Freedom of Economic Activity
- Act on Environment Protection Law
- Act on the Provision of Information on the Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessments
- Water Act (18 July 2001)
- Mining Waste Act (10 July 2008)
- Waste Act (27 April 2001)

» EU level:

- Directive 94/22/EC on the conditions for granting and using authorizations for the prospection, exploration and production of hydrocarbons
- Directive 2006/21/EC on the management of waste from extractive industries
Directive 2000/60/EC establishing a framework for Community action in the field of water policy
- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment



Concessions for Hydrocarbons

Between 1945 and 2006 (**60** years)

148 concessions for HC prospection and exploration have been granted

202 concessions for HC exploitation / production have been granted



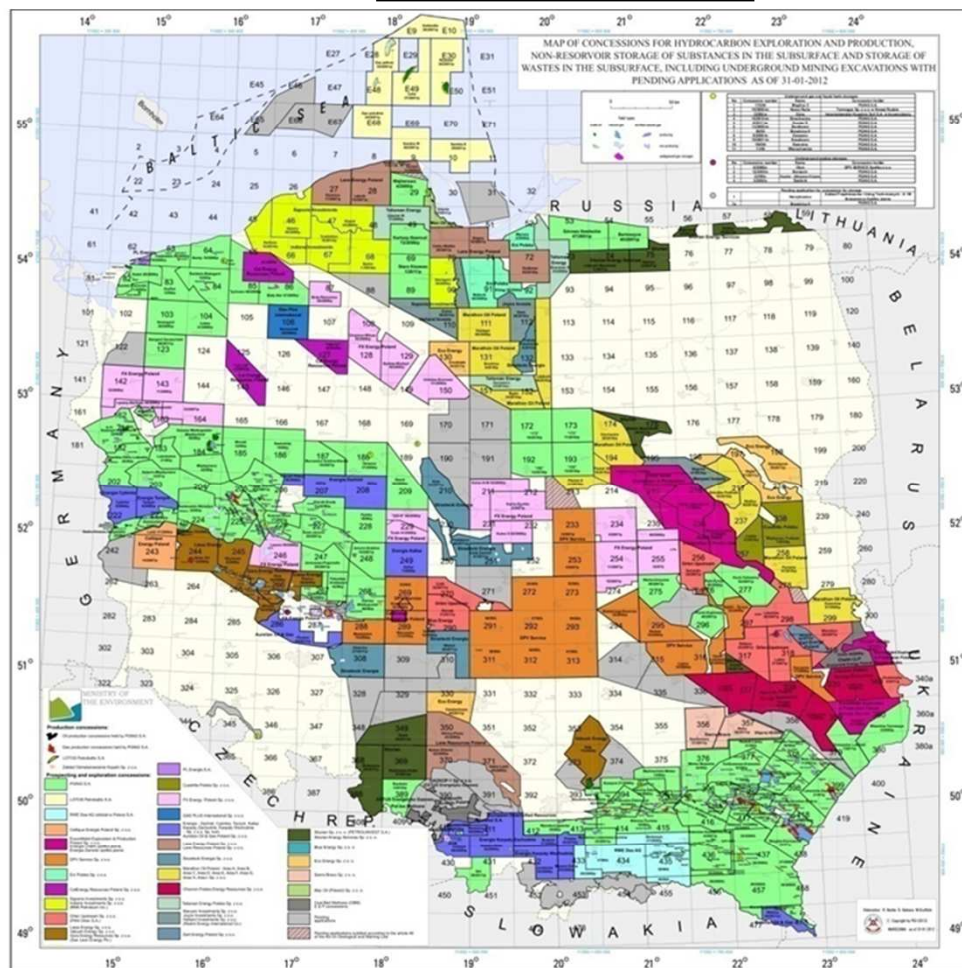
Concessions for Hydrocarbons

Between 2007 and 2011 (4 years)

109 concessions for shale and tight gas
prospection and exploration have been
granted

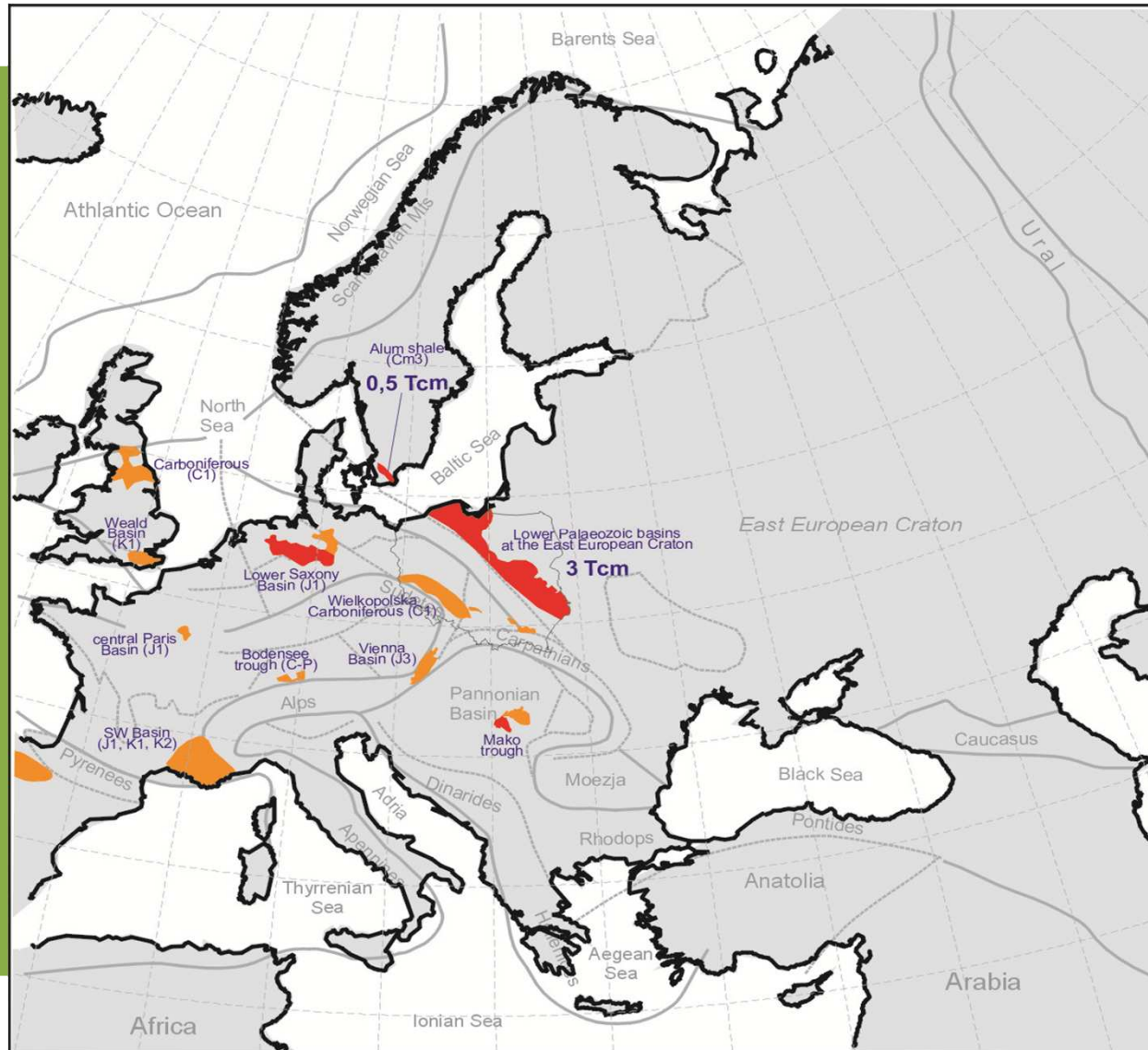
0 concessions for shale and tight gas
exploitation / production has been granted



Acreage of 109 concessions total: 92 764 km²
(**21 100 000** acres)





Shale Gas in Europe

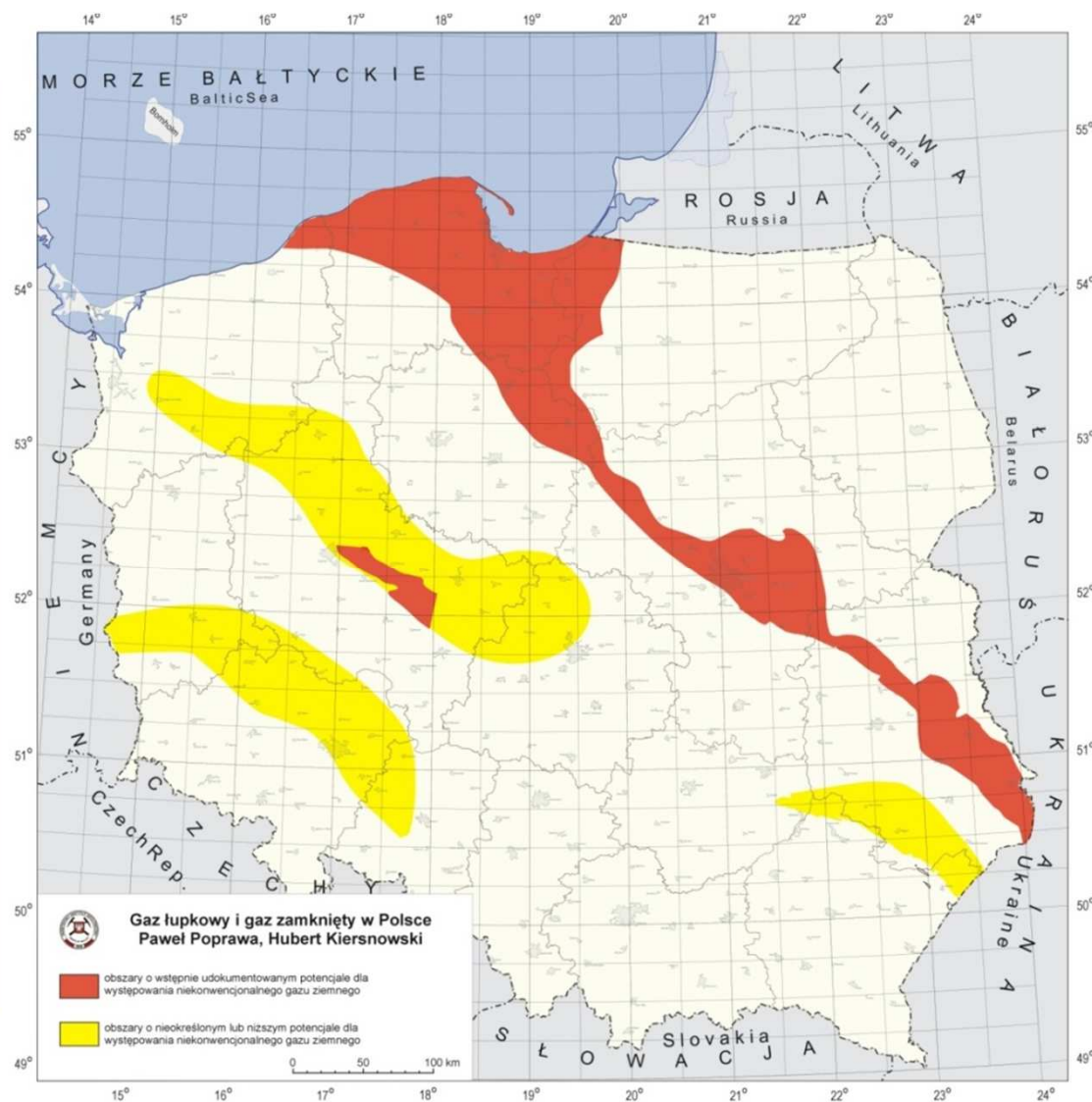


-  basins considered for shale gas exploration
-  basins with current shale gas exploration



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Shale Gas and Tight Gas Basins in Poland





- **22** exploration drills has started by 2011
- **13** exploration wells completed by February 2012
 - **9** of them with fracking
 - **2** of them with horizontal drills
- **14** exploration new wells planned for 2012
- **123** exploration new wells planned by 2017 **so far...**



Shale Gas Resources in Poland?

5300 BCM – Energy Information Agency, 2011

3000 BCM – Advanced Res. Int., 2009

1400 BCM – Wood Mackenzie, 2009

1000 BCM – Rystad Energy, 2010



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But...



First Poland's Official Shale Gas Resources Estimation Report

prepared by:

**Polish Geological Institute -
Polish Geological Survey**
in cooperation with USGS

will be published on **21 March 2012**



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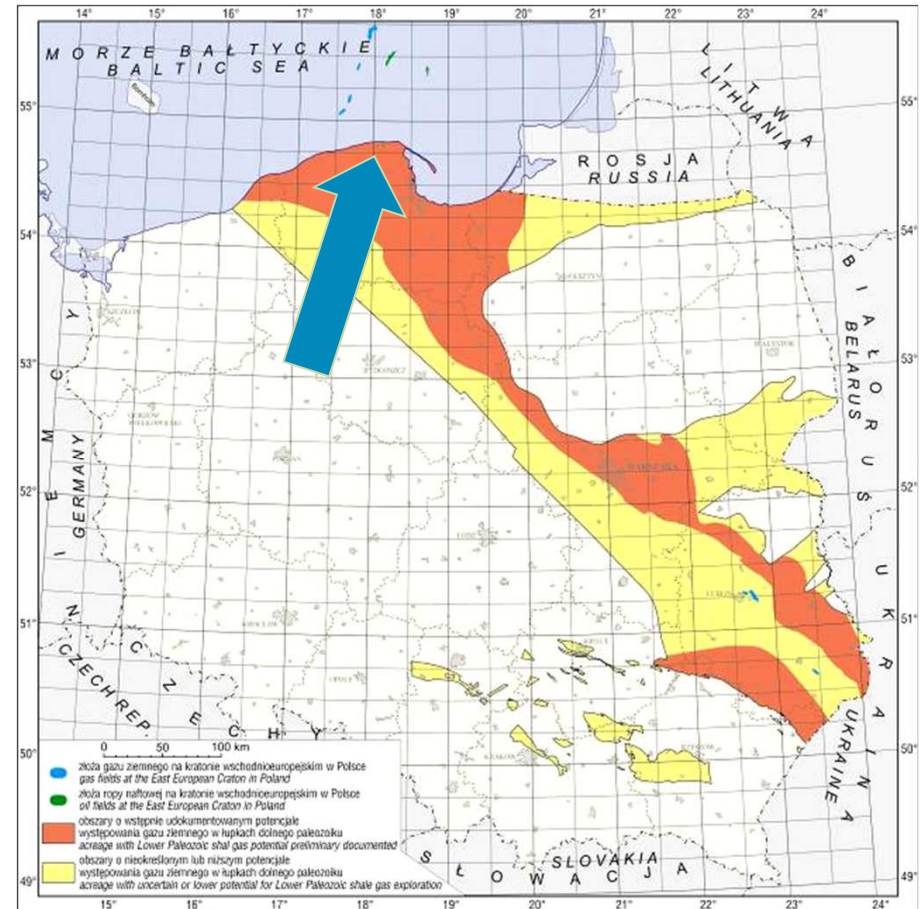
Report on Lebien Shale Gas Horizontal Drilling and Fracking - Environmental Impact Assessment

Information about the drilling:

- concession granted by the Minister of the Environment in October 2007 for Lane Energy Poland (3Legs Resources)
- total drill length (together with horizontal) – 4,080 m
- hydraulic fracturing – August 2011

Information about the Report:

- published on 2 March 2012
- coordinated by the Polish Geological Institute
- main aim of the report – to evaluate influence of hydraulic fracturing on environment
- available at www.pgi.gov.pl





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Report on Lebien Shale Gas Horizontal Drilling and Fracking - Environmental Impact Assessment

Results of the report :

- hydraulic fracturing did not generate any air pollution,
- temporary elevated noise levels during fracturing, however within permissible levels,
- no effect on the quality of surface and groundwater,
- water intake did not affect the reduction of groundwater resources in the area of the drilling,
- no noticeable changes in composition of soil gas, especially in concentration of methane and radioactive radon,

www.pgi.gov.pl





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Report on Lebien Shale Gas Horizontal Drilling and Fracking - Environmental Impact Assessment

Conclusions:

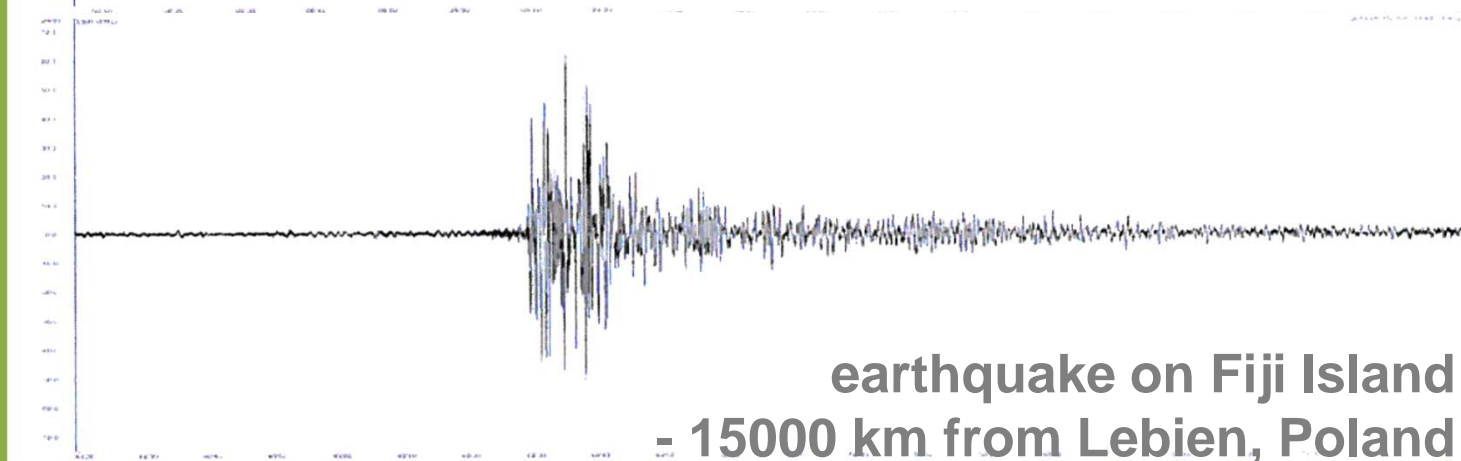
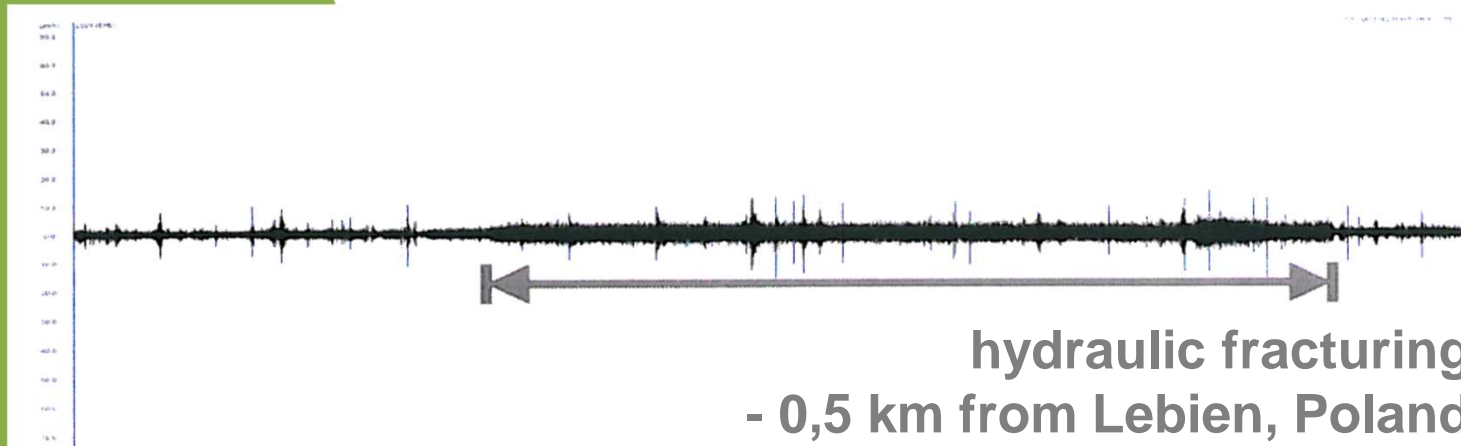
- additives used for hydraulic fracturing are public information in Poland and have to be approved by State Mining Authority (on the contrary to France – according to DG ENER Report of 27 January 2012)
- every well/pad has to be granted with Environmental Impact Assessment administrative decision (on the contrary to Germany – according to DG ENER Report of 27 January 2012)
- fracturing treatment did not cause earthquakes

www.pgi.gov.pl





Seismic monitoring



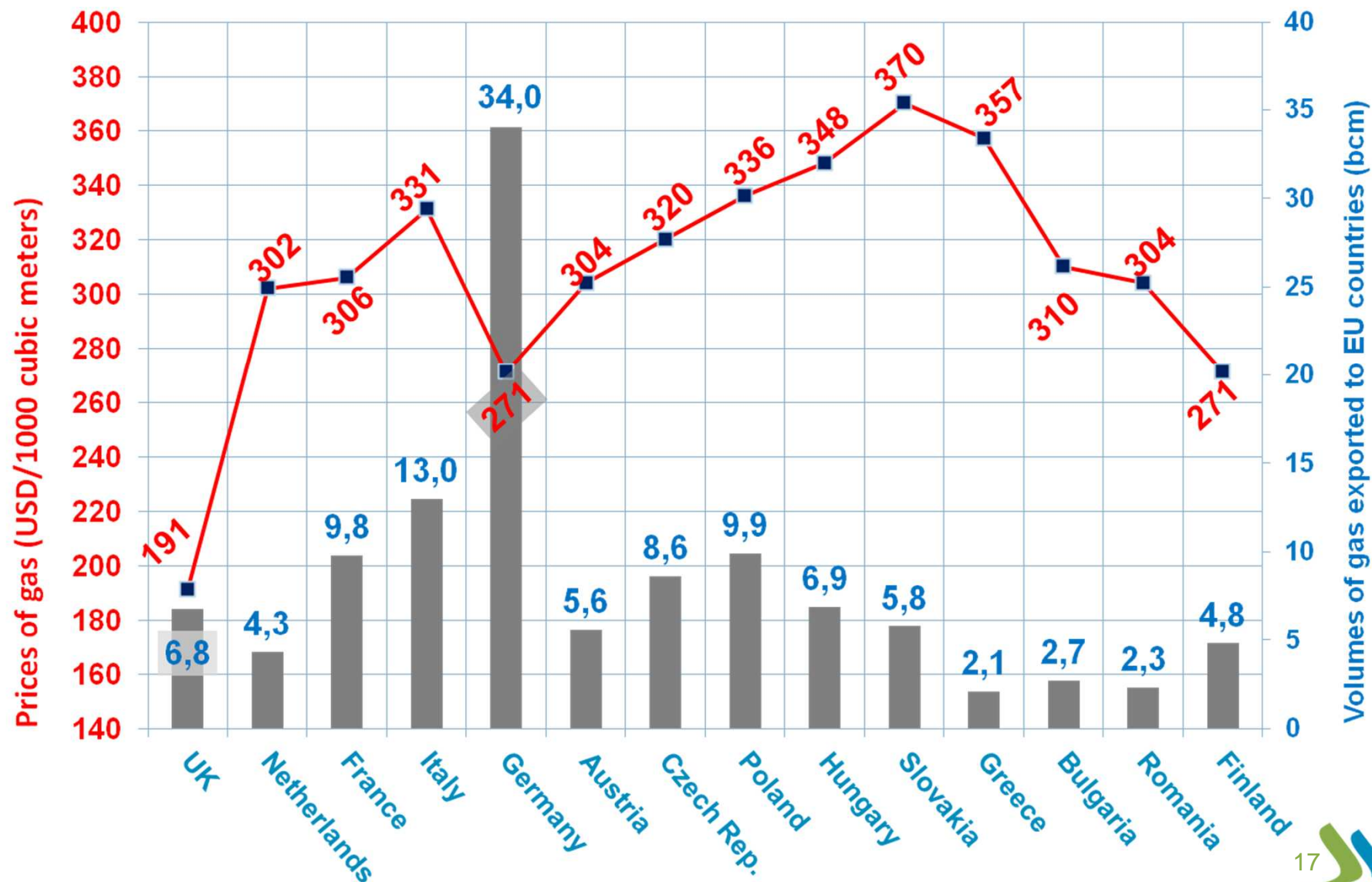
Basic Economic Data of Poland

Increase of GDP (2011^e)	4,1%	
Inflation (2011^e)	4,2%	
Natural gas consumption <i>per capita</i> (2010)	350 CM	(EU average: 1000 CM)
Gas-fired power plants consumption (2011)	0,9 BCM	
Natural gas domestic production (2010)	4.5 BCM	
Import of natural gas (2010)	10 BCM	mainly from Russia
Price of natural gas - Henry Hub USA	83 USD/1000 m³	- February 2012
Price of natural gas – BAFA Germany	374 USD/1000 m³	- December 2011
Balance of Foreign Trade of Chemical Products	- 7 590 000 000 EUR	



GAZPROM Gas Prices for EU - 2010

Source: www.vedomosti.ru – 25th February 2011





Shale Gas in Poland - Conclusions

1. No single shale gas fields has been fully documented in Poland yet
2. 109 shale gas concessions for prospecting and exploration have been granted so far
3. No single shale gas concession for exploitation/production has been granted yet
4. It has been proved that shale gas exploration & fracking has no environmental impact
5. Every shale gas well/pad has to be granted with Environmental Impact Assessment decision
6. Additives used for fracking are public information in Poland
7. First Poland's Official Shale Gas Estimation Report – on 21 March 2012
8. Production concessions policy and taxation policy will be modernised according to Norwegian patterns





Shale Gas in Poland - Perspective

1. Shale gas will decrease Gazprom's gas price benchmark in Poland and in CEE region
2. Shale gas will force energy market liberalisation in Poland and CEE region
3. Shale gas will improve energy security - diversification of energy supply sources by increasing domestic production
4. (Shale) gas-fired new power plants in Poland will reduce CO₂ footprint



Post Scriptum

Klaus Sontgerath - Head of Department at Lower Saxony State Authority for Mining, Energy and Geology:

„Germany has been fracking since 1955 in the Schleswig-Holstein region and since 1976 in the country's Lower Saxony region.“

*“[...] this is mainly unconventional gas, with tight gas exploration at depths of 4-5 thousand meters. And up until now, we do not know of **any environmental incidents caused by fracking.**”*

Mr Sontgerath quoting Jorg Bode - Lower Saxony's minister of Economic affairs:

“There are no higher safety and environmental risks because of hydraulic fracturing,”

*“[...] in Lower Saxony **hydraulic fracturing was used 35 years ago for the first time and has been successful in more than 250 projects.**”*

Source:

- <http://www.naturalgaseurope.com/germanys-advancing-shale-plays-3581>
- *European Unconventional Gas Developments, Environmental Issues and Regulatory Challenges in the EU and the US* - March 14, 2011 at Conseil Central de l'Economie, Brussels



Fracturing

Fracturing in Germany

in use since:

- 1955 (Schleswig-Holstein),
- 1977 (Lower Saxony)

Fracturing in Poland

in use since:

- 1956-57 (Podkarpacie, fields: Wielopole, Bóbrka, Wańkowa),
- 1959 (Krosno) set up Division of Fracturing in P.P. Kopalnictwo Naftowe (PGNiG)



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THANK YOU
FOR YOUR ATTENTION

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