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SHALE GAS IN POLAND

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Adviser to the Minister of Environment and to Chief National Geologist
Paris, 6th December 2012

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Shale Gas Resources in Poland?

- 3000 BCM – Advanced Res. Int., 2009
- 1400 BCM – Wood Mackenzie, 2009
- 1000 BCM – Rystad Energy, 2010
- 5300 BCM – EIA – US Department of Energy, 2011
- 35 BCM – USGS – US Department of Interior, 2012

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First Poland's Official Report on Shale Gas & Oil (excluding Tight Gas) Recoverable Resources
21 March 2012




presented by:
Polish Geological Institute – National Research Institute

based on:
USGS methodology and archive geological data collected from key 39 wells drilled before 1990

second report:
in 2013 – verified with data collected from wells drilled in 2010-2011 and tight gas estimation




available at: www.pgi.gov.pl


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**Shale Gas:
Recoverable Resources in Poland**

Maximum 1920 bcm, but most probably :

<p>345 - 768 bcm of shale gas</p>		<p>2,5 - 5,5 times more than proven resources of gas from conventional resources</p>
		<p>35 - 65 years of Poland's cumulative gas consumption (incl. proven resources of gas from conventional resources)</p>
		<p>110 - 200 years of Poland's gas production without decreasing of import (incl. proven resources of gas from conventional resources)</p>


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**Shale Oil:
Recoverable Resources in Poland**

Maximum 535 MMT (3905 MMB) of oil, but most probably:

<p style="font-size: 1.2em; font-weight: bold; color: red;">215 - 268</p> <p style="font-weight: bold;">MMTons of shale oil</p> <p style="font-size: 1.2em; font-weight: bold; color: red;">(1569 – 1956 MM Barel(s))</p>	<p>→</p> <p>→</p> <p>→</p>	<p style="font-weight: bold; color: red;">8,5 to 10,5 times more</p> <p>than proven resources of oil from conventional resources</p>
		<p style="font-weight: bold; color: red;">10 to 12 years</p> <p>of Poland's cummulative oil consumption (incl. resources of oil from conventional resources)</p>
		<p style="font-weight: bold; color: red;">360 to 440 years</p> <p>of Poland's oil production without decreasing of import (incl. resources of oil from conventional resources)</p>





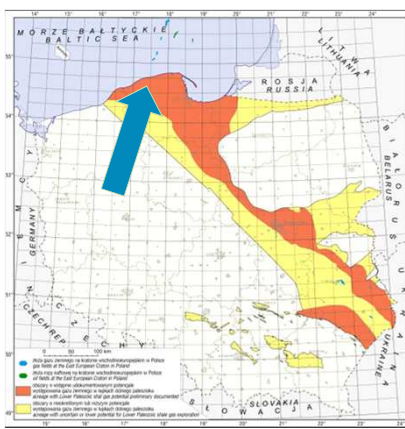
**Lebien Shale Gas
Horizontal Drilling and Fracking
- Environmental Impact Comprehensive Study**


Information about the drilling:


- concession of 3LegsResources (ConnocoPhillips)
- total drill length (vertical & horizontal) – 4080 m

Information about the Report:

- published on 2 March 2012
- prepared by:
 - Polish Geological Institute,
 - Polish Academy of Sciences,
 - Warsaw University of Technology,
 - Regional Inspectorate for Envi. Protection,
 - Oil and Gas Research Institute
- available at www.pgi.gov.pl






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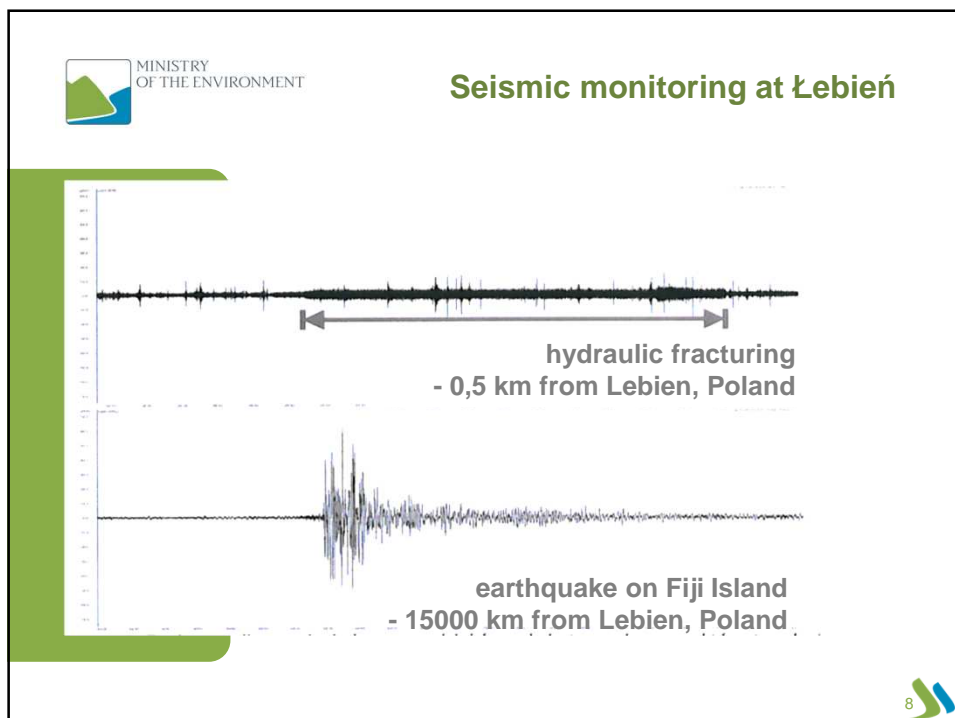
Lebien Shale Gas Horizontal Drilling and Fracking - Environmental Impact Comprehensive Study

Results of the study :

- 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 or 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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Three Basins Environmental Study

A new comprehensive Environment Monitoring project :

- on-site monitoring of various environmental aspects of shale gas exploration - May 2012 – November 2013
- this will be the largest study of this kind ever made in Europe
- project is implemented by General Directorate for Environmental Protection and financed by the National Fund for Environmental Protection and Water Management
- the study will encompass seismic monitoring, measurements of gaseous emissions, measurements of noise generated, as well as analyses of soil gas, surface and ground water before during and after hydraulic fracturing
- the study will be conducted on 5 different drilling sites, selected from different regions of Poland covering areas of different environmental and geological characteristics



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Fracking - last but not least

Fracking in Poland – history:

- **1956-57**
(Podkarpackie Region, fields: Wielopole, Bóbrka, Wańkowa),
- **1959**
setting up Division of Fracturing in Polish Oil And Gas Industry





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Fracking – quotes:

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

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Shale gas in Poland – still exploration phase

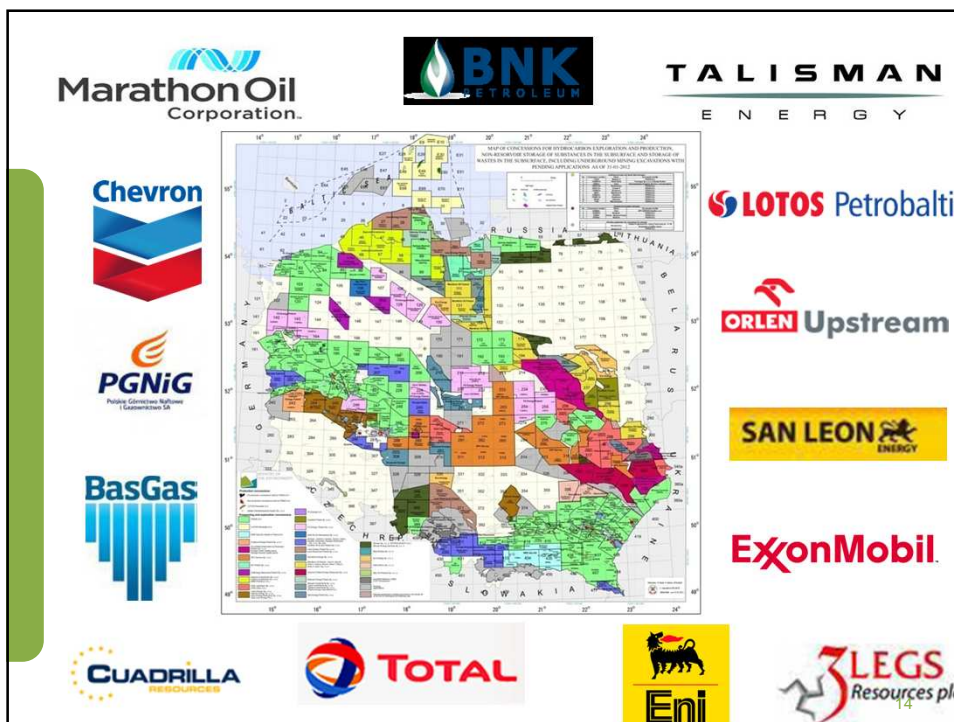
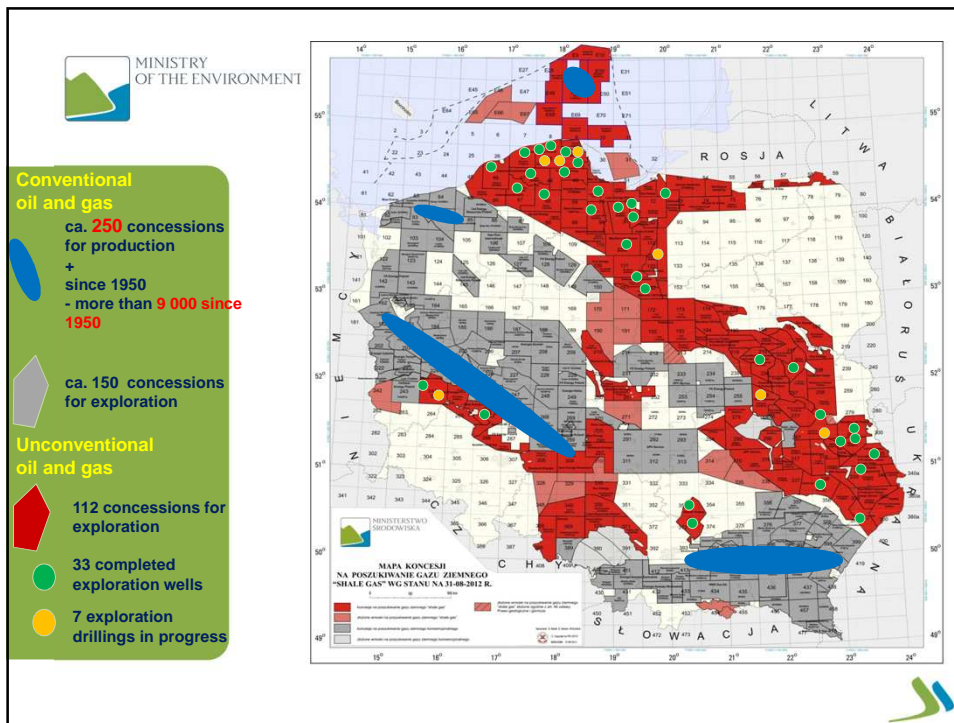
➤ **33 exploration wells completed by 30th November 2012**

	no fracking	with fracking	TOTAL
vertical only	23	8	31
vertical & horizontal	0	2	2
TOTAL	23	10	33

➤ **another 7 exploration drills in progress now**

➤ **another 270 exploration wells planned by 2021**

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Shale gas - future perspective for Poland

- Poland is **the leader of shale gas exploration in Europe**
– with the highest number of exploration wells completed
- **Poland is a leader of comprehensive environmental monitoring** of shale gas exploration
- **The biggest international and Polish companies are currently exploring for shale gas in Poland**




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The most important benefits to Poland

- **More gas from domestic production on the Polish market**
- **Decrease of gas prices** = cheaper energy = economy drive
- **Economy impulse** = jobs in the new industry, significant economy incentive
- **Decreased dependency on import** = higher gas supply security
- **Modern management and supervision system** (environment protection, State security, rational deposit exploitation)
- **Fair profit distribution**, including new incomes for the state budget and the budgets of local governments
- Long-term economic security - **Hydrocarbon Fund of Generations**







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In the coming three years

- **Acceleration of deposit prospection and exploration** – more exploration wells to come
- **Preparation for production stage** – management and supervision system and attractive taxation regime
- **The State as a capital shareholder in new concessions**
- **Poland - the most attractive country in Europe for investors in E&P shale gas projects**

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Act on hydrocarbon exploration and production, hydrocarbon taxes and the Hydrocarbon Fund of Generations






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New Act on Hydrocarbons

- Key changes

- **NOKE (state owned operator) as a equity shareholder on new blocks**
- **No concession needed for prospection stage (only surface works), and single concession for exploration & production stage**
- **Tenders for concessions only for pre-qualified companies** (industry record, financial standing, environmental security record)
- **Security of concession resale** - pre-emptive right for NOKE to buy shares in concessions. Acquisition of concessions resold possible only for pre-qualified companies
- **New taxes on production and modified environmental fees**
- **Streamlined, simplified procedures of environmental permitting**
- **Hydrocarbon Regulator/Geological Supervision**
- **Hydrocarbon Fund of Generations**




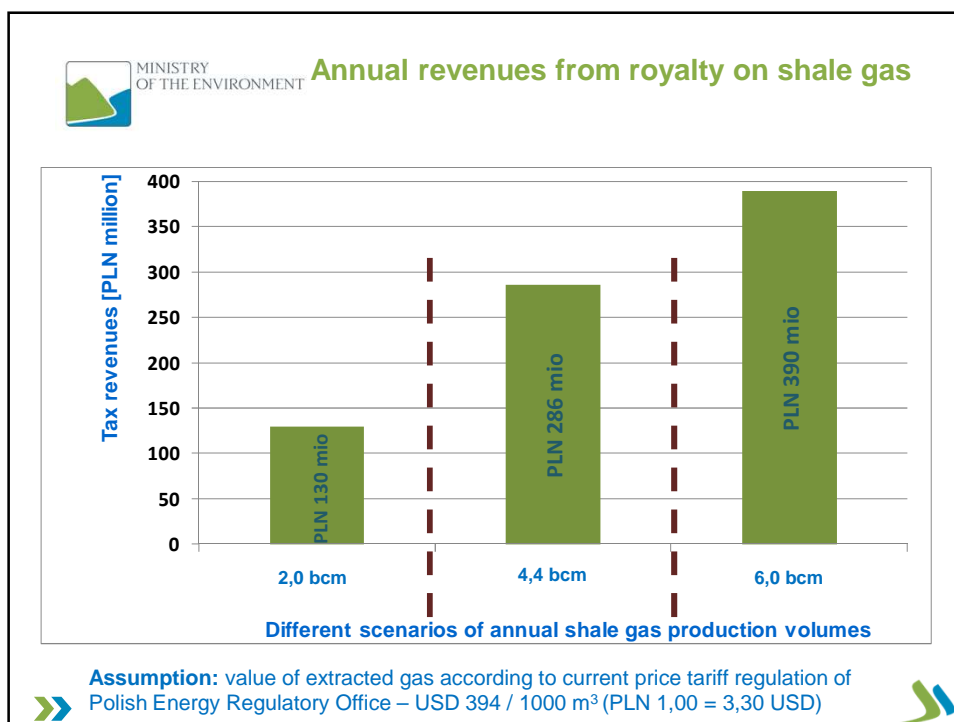

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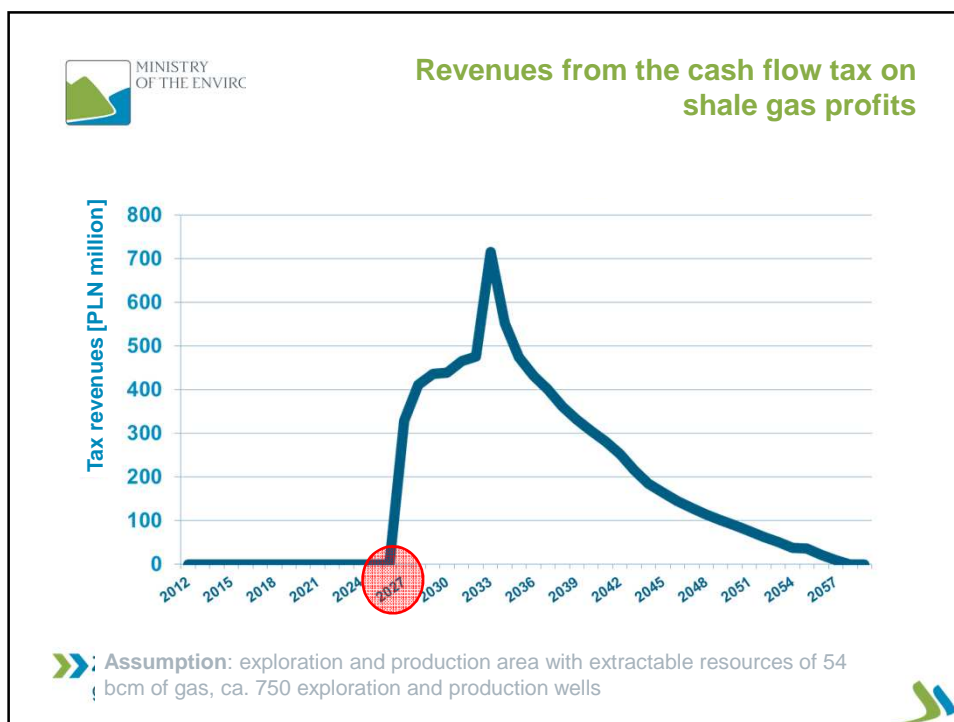
New Act on Hydrocarbons - new incomes for the State Budget

Two new taxes on production of gas and oil in the territory of Poland:

- 1.** *Tax on minerals production – royalty (extended for hydrocarbons):*
 - 5% of the value of extracted natural gas
 - 10% of the value of extracted crude oil
 - + Corporate Income Tax loss deduction
- 2.** *Special hydrocarbon cash flow tax (tax on hydrocarbon production profit)*
 - 25 %

Taxes will relate to conventional and unconventional hydrocarbon deposits
 Taxes will be paid by all entities producing oil and gas in Poland
 Taxes will be directed to the state budget and the Hydrocarbon Fund of Generations
 New taxes provisions should enter into force not earlier than 2015 – provided that large-scale shale gas production is launched and the gas market is liberalised



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New Act on Hydrocarbons - new incomes for local governments

Higher extraction/environmental fee for local governments and National Fund for Environmental Protection and Water Management

Extraction / environmental fee:

- PLN 24,00 (5,45 EUR) per 1000 m3 of methane-rich gas
- PLN 50,00 (11,35 EUR) per 1 tonne of crude oil

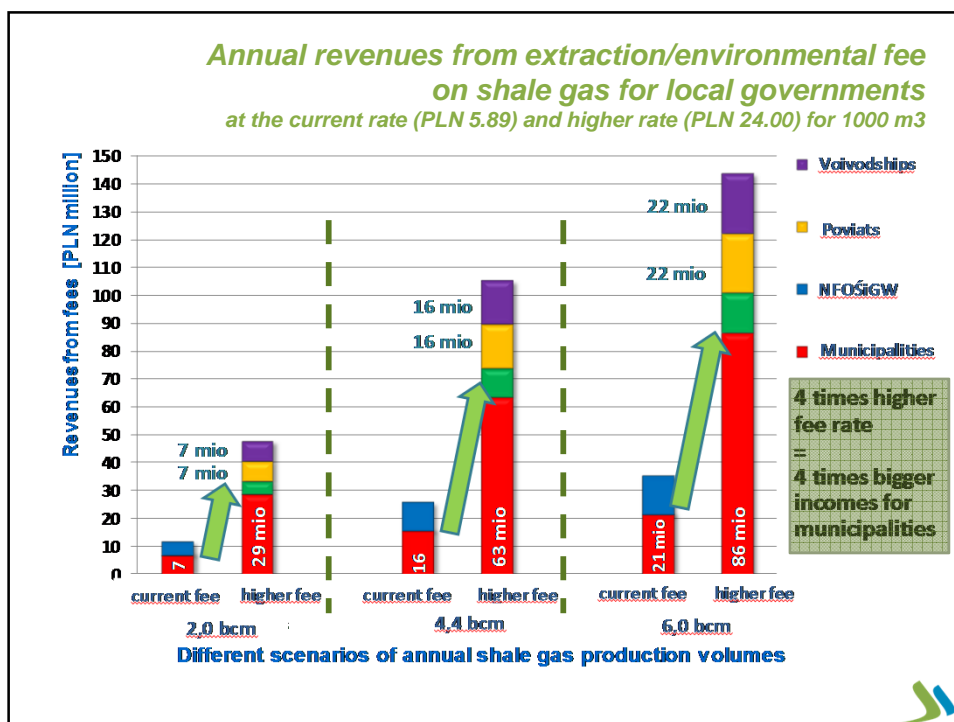
The fee will be transferred directly to:


- Municipalities (60% share)
- Poviats (15% share)
- Voivodeships - Regions (15% share)
- The National Fund for Environmental Protection and Water Management (10% share)

The fee will relate to conventional and unconventional hydrocarbon deposits

The fee will be paid by all entities producing oil and gas in Poland

New rates and division of the fee should enter into force not earlier than 2015— provided that large-scale shale gas production is launched and the gas market is liberalised




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New Act on Hydrocarbons
 - new benefits to the State

In total,
 the **government take**
 (Royalty Tax, Cash Flow Tax, Corporate
 Income Tax and Real Estate Taxes)
 should amount ca. **40% of gross profit**
 of the oil and gas industry.

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New Act on Hydrocarbons

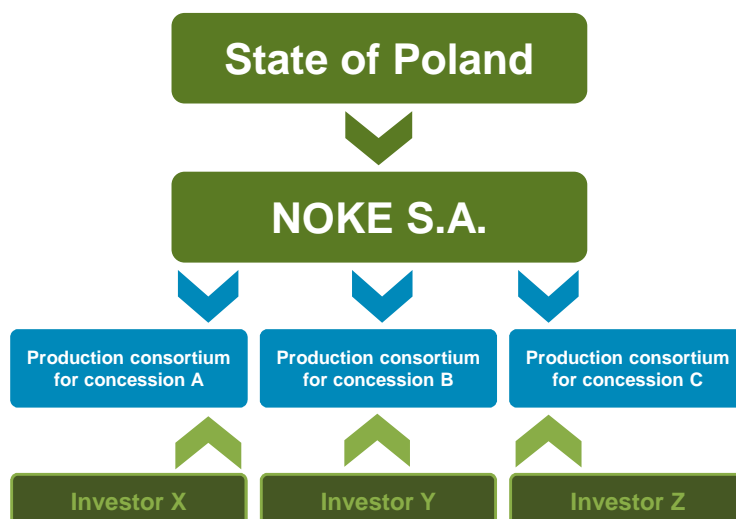
- NOKE / National Operator of Energy Minerals

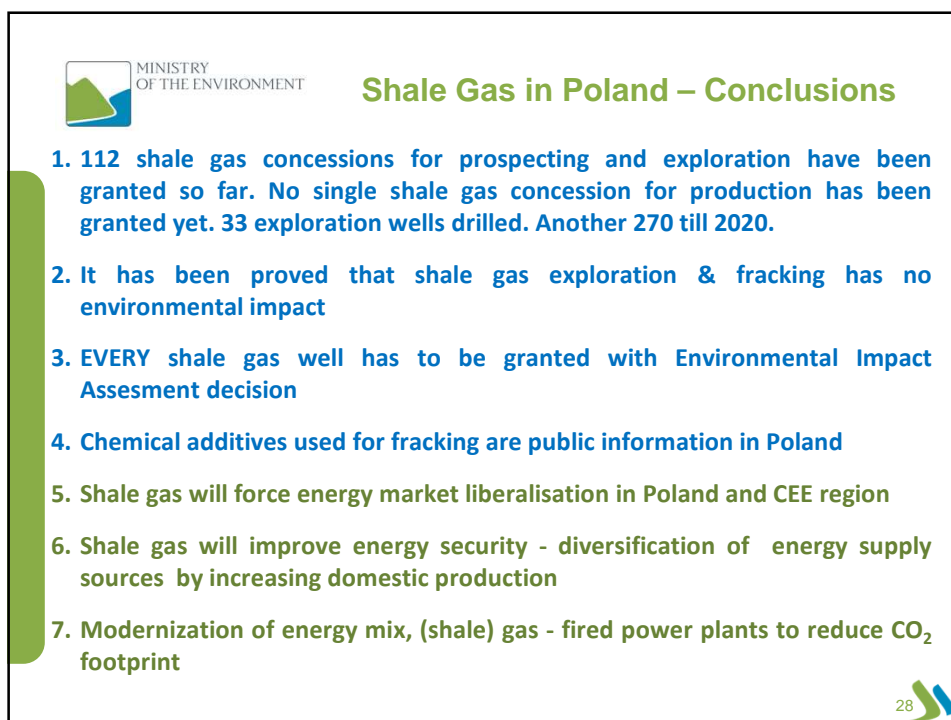
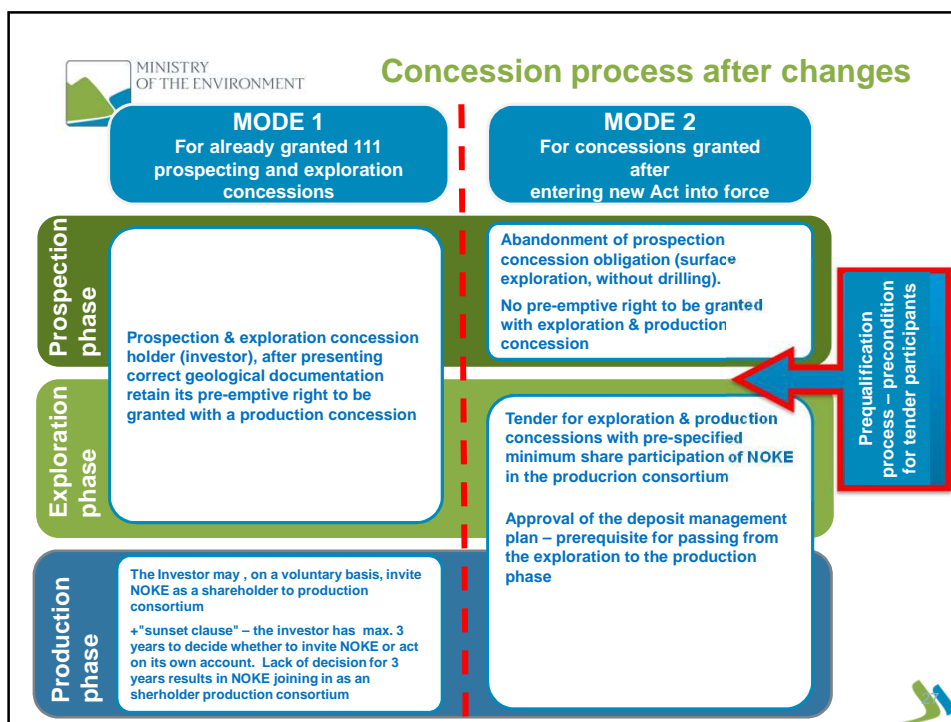
- 100% state owned company
- equity partnerships/shared concessions investor
- best management of reserves and profits
- maximizing of the value of deposits
- minimization technical and environmental risks
- increase financial credibility of projects
- equal footing for permitting and taxation

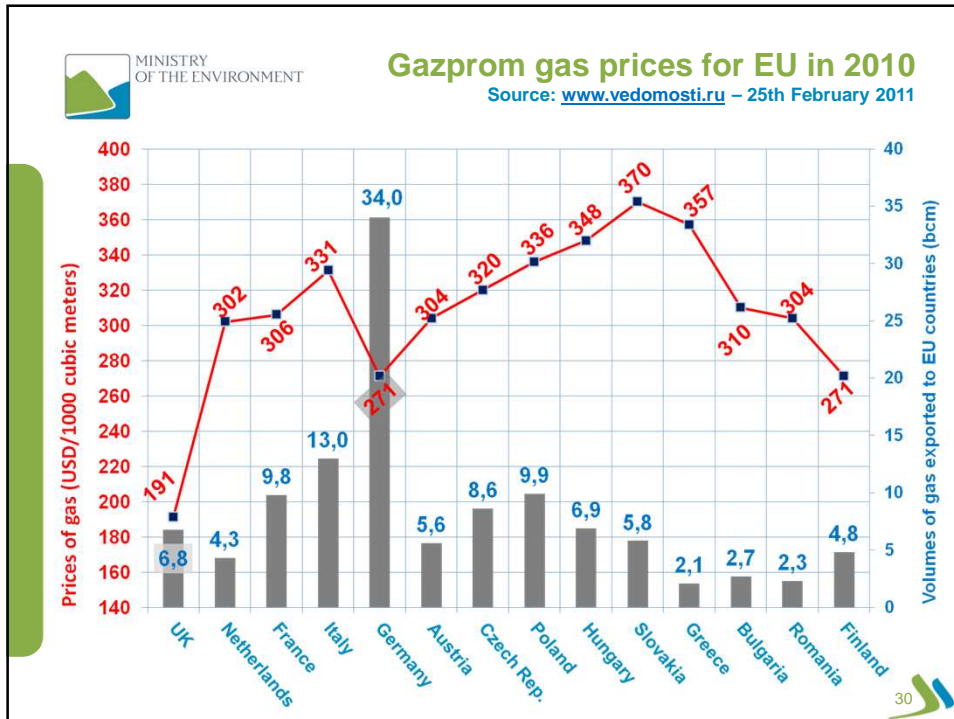
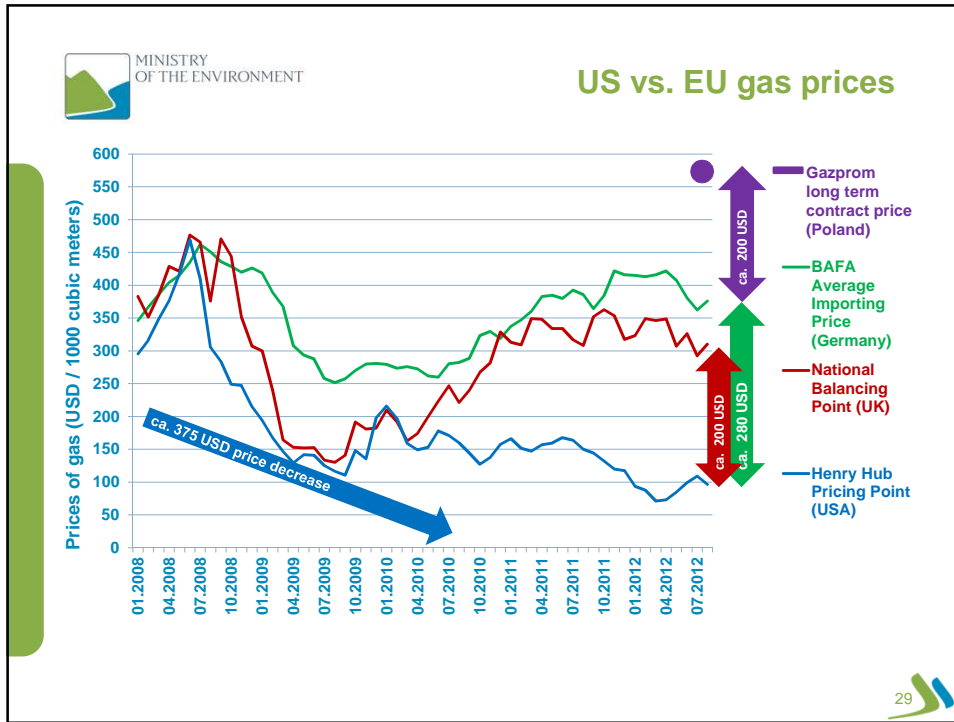
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New Act on Hydrocarbons

- state's participation in production









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THANK YOU FOR YOUR
ATTENTION

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