



# Shale Gas in Poland - an Opportunity or a Chimera?

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## Energy Security concerns driving shale and unconventional gas focus in Poland

Poland with its large population of 38 million people and significant industrial growth over recent decades has been a key force in shaping the European Union’s Energy Security Policy. The EU is highly dependent on energy imports with 65% of its gas and 87% of oil supplied from outside the region. *(source: EU energy in figures 2015 pp70-72)* Despite significant coal reserves, which underpin Poland’s electricity and heat generation networks, Poland remains dependent on Russian sourced gas.

The development of new energy resources, such as the shale gas developments in Poland, are being driven by the policy makers desire to reduce dependence on these imports and find new lower cost sources of energy to support the ongoing competitiveness of manufacturing and energy intensive industries. There is also interest in utilisation of coal gasification technologies (underground and above ground) to reduce the reliance on gas imports.

The unanswered question, *Is Shale gas development in Poland a real opportunity or a mere chimera?*

## History of Shale Gas Developments in Poland

In Poland conventional gas deposits have been developed since the mid nineteenth century. Initial attempts to extract gas from clay rocks (unconventional deposits) were made in the 19th century, however, due to technology limitations the production was not commercially feasible. It was not until the development of horizontal drilling and hydraulic fracturing technologies in the late twentieth century that the production of unconventional gas became possible on an industrial scale.

Poland has had a strong interest in shale gas exploitation as it has limited reserves of oil (24 million tonnes and 85 operating oil wells). *(source: [http://geoportal.pgi.gov.pl/surowce/energetyczne/ropa\\_naftowa](http://geoportal.pgi.gov.pl/surowce/energetyczne/ropa_naftowa))* and conventional gas reserves (recoverable natural gas resources are estimated at 129.75 Billion cubic meters (bcm).):

*(Source: [http://geoportal.pgi.gov.pl/surowce/energetyczne/gaz\\_ziemny](http://geoportal.pgi.gov.pl/surowce/energetyczne/gaz_ziemny))*

The limited domestic gas production of 3.8 million tonnes oil equivalent (Mtoe) only satisfies around 28% of the total annual demand for gas of around 13.7 Mtoe. *(source: EU energy in figures 2015 pp216-217)* The new LNG received terminal at Swinoujscie with maximum capacity of 5 bcm will assist, but there remains a significant gap that Poland is seeking to address through development of shale and unconventional gas resources.

Policy makers in Poland have been over the last 5 years been seeking to stimulate the development of Poland’s nascent shale gas sector. The optimism has been sparked by claimed reserves of up to 5,000 bcm of shale gas in Poland. *(Source: Euracoal <http://euracoal.eu/info/country-profiles/poland/>)* If shale gas can be extracted on an industrial scale, it is hoped that it will dramatically lower energy costs and support continued development of Poland’s industrial sector.

## The Shale Gas Basins in Poland

Poland has significant shale gas deposits, stretching from the northern Baltic Sea coast to the south-eastern borders with Ukraine and Belarus and along the Lublin Basin, totalling over 5,000bcm. (source: Euracoal <http://euracoal.eu/info/country-profiles/poland/>). The PGI (Polish Geological Institute) has estimated that recoverable shale reserves are 768 bcm. More accurate estimates of the quantity and quality of Polish shale gas will become known as the test drilling programs expand. Experts estimate that the recoverable reserves will not be known for up to three years and industrial scale production will require a further decade to develop.

Shale gas can be found at the depth of 1,200 – 2,500 metres in the northern, and at 2500 – 4500 metres in the southern part of the deposit layer. (source: <http://www.mdi.com.pl/en/raporty/shale-gas.pdf> page8)

It was initially thought that Poland had similar geological conditions to those in the USA which has quickly expanded its shale gas production. However, exploration companies report that the geological structure of Polish shale deposits are different in terms of rock permeability and access to shale gas maybe more difficult to extract than in the USA even with the use of hydraulic fracking technologies.

In view of these technical challenges, the implementation of specialised drilling and fracking technologies which reduce extraction costs may be required. As a consequence, commercial scale extraction may not be profitable in light of the current level of global gas prices.

## The “Shale Exodus”

The initial shale gas “rush” between 2011 And 2013, saw a number of major international energy companies and junior explorers join the local energy sector in seeking shale gas concessions.

Despite the initial optimism regarding the prospects of shale gas exploration in Poland the current situation is proving not to be as favourable as initially thought. A number of companies, which had commenced exploration of gas in the shale deposits in Poland have withdrawn from the country (Exxon Mobil, Eni, Marathon Oil, San Leon Energy, Talisman Energy, 3Legs Resources and most recently Chevron).

As of April 2015, there are 47 active concessions for shale gas in place. There are currently 14 Polish and international concession holders with 70 shale gas exploration wells, including 16 directional/horizontal and 54 vertical wells. (Source: <http://infolupki.pgi.gov.pl/en/exploration-status/news/shale-gas-exploration-status-poland-april-2015>)

For the first eight months of 2015, only 2 wells were completed for oil and gas in Polish shale compared to 8 completed wells in the same period last year. (Source <http://infolupki.pgi.gov.pl/en/exploration-status/news/shale-gas-exploration-status-poland-april-2015>) The majority of active wells have been established by PGNiG - the largest Polish oil and gas exploration and production company - (72% Governmental ownership) and PKN Orlen – Poland’s largest petroleum processor - (27% Governmental ownership).

To-date, PLN 2.5 billion (USD 0.6 billion) has been spent by investors on shale gas exploration in Poland. (source: <http://ik.org.pl/en/publikacja/nr/7922/page6>)

It has been reported that the exit of international explorers has been driven by a combination of unfavourable regulatory framework (largely resolved by recent amendments), lower commodity prices, and disappointing results from early drilling due to difficult geology conditions (shale permeability).

The cost of drilling is also having a significant impact on exploration and development. According to the Organization Polish Exploration Industry Mining (OPPPW) the average cost of a developing a vertical well in Poland

amounts to approximately PLN 35.5 million, and directional drilling with full fracturing treatment hydraulic at least PLN 60 million (USD 15 million) - as compared to the USA where the average cost amounts to approximately USD 8 million). If the costs are to be reduced to international benchmarks, additional research is necessary.

(source: <http://ik.org.pl/en/publikacja/nr/7922/page6>)

The pace of shale gas exploration in Poland has slowed. The revitalisation of the sector will require a “circuit breaker” to revitalise investment. This could come in the form of a technological, commodity price, regulatory or financial incentive “circuit breaker”.

## Government policy – Regulatory environment

Poland’s Ministry of the Environment is the primary regulator and concession granting body. The early investment in the sector was hampered by cumbersome regulatory and administrative procedures which have been largely addressed. The amended regulations which came into force from January 1, 2015, have reduced red tape and provide more flexible procedures for the shale gas industry. The changes include:

- one concession only is required for both the exploration and extraction phases of a development
- concession tenures will be granted for 10 to 30 year periods by an open tender process organized by the Ministry of Environment.
- production is now possible already during the exploration stage.
- geophysical surveys require a notification only, instead of a separate permit.
- security deposit of up to 20 percent of the costs of geological works
- environmental approval required prior to drilling rather than at the concession application stage
- extraction of shale gas in Poland will be exempt from tax till 2020.

These changes are expected to stimulate investment in the sector through reducing permitting costs, increasing transparency and create a more certain royalty regime.

(Source: <http://infolupki.pgi.gov.pl/en/law-concessions/assessment-amended-geological-and-mining-law-terms-new-powers-and-responsibilities>)

## Opportunities for Australian Organisations

The development of Poland’s shale gas sector has slowed and as a consequence opportunities for Australian companies interested in the sector may be limited. However, along with the United Kingdom, Poland is one of the few countries in Europe that is supportive for shale and unconventional gas development.

Australian companies considering shale gas exploration should consider connecting with a local company (Joint Venture) who has sound knowledge of the local environmental, legislative and operational aspects.

If you are considering supplying products and services to the existing exploration companies, an opportunity may be as a result of the challenging geological structure of Polish Shale gas deposits. Specifically, applying solutions that reduce the cost of extraction. Opportunities in areas such as:

- Shale gas deposit mapping and planning software and know-how
- Directional (horizontal and vertical) drilling technologies and drilling equipment
- Specialised drilling rigs
- Safe shale hydraulic fracking technologies to ensure environmental protection guideline requirements.

## Contact details

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