Poland Coal Sector Update
Global Methane Initiative
Coal Subcommittee Meeting

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Central Mining Institute, Katowice, Poland
Experimental Mine „Barbara”
Basic information

GŁÓWNY INSTYTUT GÓRNICTWA
(GIG)
CENTRAL MINING INSTITUTE
is a scientific-development organization combined since the year 1945 with the Upper Silesian extractive industry and region
Where are we?

We are in the heart of Polish hard coal mining industry, namely in Upper Silesia, in Katowice.
AREAS OF GIG’s activities

- Environmental engineering
- Safety and certification
- Mining and Geoengineering
- Education
POLISH MINING INDUSTRY in brief
Coal in Europe and Poland

Poland in 2014 [mln Mg]

Source: Euracoal
Polish coal basins and reserves

- **Resources:** 56,220.48 Mt
- **Economic resources:** 3,573.69Mt
- **Production** – 72.2 Mt,
  - 59.2 Mt Steam coal,
  - 13.0 Mt Coking coal
- **Number of hard coal mines** – 30
- **Hard coal companies:**
  - Polska Grupa Górnicza
  - Katowicki Holding Węglowy
  - Jastrzębska Spółka Węglowa
  - Węglokoks Kraj Sp. z o.o.
  - Spółka Restrukturyzacji Kopalń S.A.
  - Tauron Wydobycie S.A.
  - Lubelski Węgiel Bogdanka
  - Others mines (Siltech, Eco-Plus, Silesia)
- **Employment** – about 85,000 workers
The coal seams are mined in conditions of natural hazards

- Gas hazards
- Fire hazard
- Dust hazard
- Seismic and rock burst hazard
- Water hazard
- Climatic hazard
- Radiation hazard

Such mining conditions negatively affect the costs of mining activity of Polish companies.
Methane in Polish coal mines
Data for the end of 2015

- In 22 mines hard coal was extracted from methane seams – release of methane;
- In 3 mines hard coal was extracted from methane seams – without release of methane;
- Only 6 mines carried out coal extraction in no-methane seams;
- In 17 mines the drainage of the coal seams were carried out – by 20 surface and 7 underground methane removal plants
Origin of the International Centre of Excellence on Coal Mine Methane

- Methane accompanying the hard coal exploitation is extremely dangerous for the underground work environment and it is also one of the most active greenhouse gases.
- Methane drainage in underground excavations in Polish mines is conducted to ensure the safety of mining operations.
- Most of the drained methane is released to the atmosphere.

IT IS ESSENTIAL TO INCREASE COMMERCIAL USE OF METHANE AS AN ENERGY SOURCE.
### CBM/CMM potential in Poland

<table>
<thead>
<tr>
<th>Specification</th>
<th>Year</th>
<th>Trend</th>
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<tr>
<td><strong>Absolute methane bearing capacity (mln m³/year)</strong></td>
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<td>2004</td>
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<td><strong>Methane drainage (mln m³/year)</strong></td>
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<td><strong>Amount of economically utilized methane (mln m³/year)</strong></td>
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Total gas released during mining operations

(about 891.2 mln m³) 847.8 mln m³ in 2013

- Ventilation Air
- Methane (VAM) 64%
- Drainage gas 36%
Methods of methane drainage in Poland:

- drainage of the coal seams ahead of mining (before exploitation),
- drainage during coal exploitation,
- drainage of goaves.
New trends in the energy sector

Support system for CBM & CMM in Poland

- Since March 11th, 2010 there is a support system for electricity produced from high efficiency cogeneration (Primary Energy Saving > 10%) from CBM and CMM.
- This system supports the efficient utilisation of CBM and CMM.
- According to the energy law records, this system will be valid until the year 2018

Long term program for CMM is needed
CMM/CBM projects outlook

- Approaches to overcoming challenges
  - Legislation and regulation
  - Policies and incentives
  - Energy pricing reform
  - Capacity building
    - 2020 EU Regulations (drastic increase of penalties !)
    - Technology transfer (need for effective surface and underground directional drilling technology)
    - Training and workshops (surface and underground directional drilling technology)
    - Polish Geological Law (after latest modifications) classifies CBM exploratory works similar like shale gas operations….
  - Agreements and/or partnerships

Polish mining sector is open for cooperation and investors
Planned projects

✓ **Polish Oil and Gas Company (CBM):** methane drainage ahead of mining using Surface directional drilling well at „Gilowice site”

✓ Specific conditions:
  - poor permeability,
  - high strength of coal,
  - poor recovery of methane

✓ Fracturing to be implemented!
Toe intersection
GIG support activities

- R&D in Central Mining Institute in Katowice to assist CMM recovery
- Tests to increase permeability of hard coals:
  - Hydro fracturing & new blasting materials
  - Borehole mining
GIG cooperation with UNECE and US EPA

- 10 years’ effective cooperation with UNECE group of experts GMI and US EPA
- US EPA grant to establish Polish VAM resources (years: 2008-2011; 250,000 USD)
- US EPA grants to define Drainage ahead of mining using surface directional drilling (years: 2009-2011; 340,000 USD)
- International Center of Excellence on CMM effect of above effective cooperation (within last year PGNiG SA, PIG joined ICE-CMM, INiG is going to join. PGG, KHW, JSW Weglokoks and Tauron are invited…)}
Conclusions – potential

- 23.7% of total methane released during mining is being utilized
- Drop in drainage methane utilization: 67.8% (in 2013) **down to 65.8%** (in 2014)
- Still venting to the atmosphere drainage gas - last year: **110 mln m3** – ready resource to utilize!
- **679.8 mln m3 VAM** (including a.m. 110mln m3 is ready to manage (subject study ?)
Conclusions

- Shale gas - long way ahead – vs CMM – resource ready to utilize!
- Smaller depth and strength
- Easier fracturing…
- Smaller investment
- Guaranty of local utilization (gas, el. & thermal energy)
- New jobs!
- Environmental benefits
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