

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 GÓRNICCTWA
(GIG)**

**CENTRAL MINING
INSTITUTE**

is a scientific-development organization
combined
since the year 1925 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



GŁÓWNY INSTYTUT GÓRNICTWA IN BRIEF

- ❑ Research institute, established 1925,
- ❑ Subordinates to the Minister of Energy of Poland,
- ❑ Employees (2017) – 493 people, including 10 professors, 17 Assoc. Prof. and 102 DSc,
- ❑ **Notifying Body No. 1453** of the European Union within the range of the directives: **2014/28/UE** – for explosives for civil uses, **2013/29/UE** – for pyrotechnic articles, **2014/34/UE** – for electrical equipment for use in potentially explosive atmospheres (ATEX), **2006/42/UE** – for machinery used underground, and **within IECEx** system that facilitates international trade in equipment and services for use in explosive atmospheres.
- ❑ **The Scientific Council** holds full academic authorizations to grant the degree of doctor and doctor habil., and to apply for the title of professor in mining (since 1961) and environmental engineering (since 1998).

EXPERIMENTAL MINE „BARBARA”

AN UNIQUE PLACE FOR MINING INVESTIGATIONS IN A REAL SCALE



COAL DUST EXPLOSION IN EXPERIMENTAL GALLERY



BLASTING BUNKER



EXPERIMENTAL ADIT

GIG in 2017

GIG 2017

3900 

3900 research and service works for nearly 1300 clients

about
100
million zł
of revenue



129 

people with academic degrees and titles among nearly 500 employees

16 

applications for an invention and utility models

17 
accredited
testing laboratories

46 

projects,
including 30 national
and 16 international ones

nearly
2400 
participants of
trainings and courses

over
200 
scientific publications

AREAS OF GIG's activities

Environmental engineering



Safety and certification



Mining and Geoengineering



Education



POLISH MINING INDUSTRY in brief



STRUCTURE OF ELECTRICITY PRODUCTION IN POLAND BETWEEN 2010 - 2017

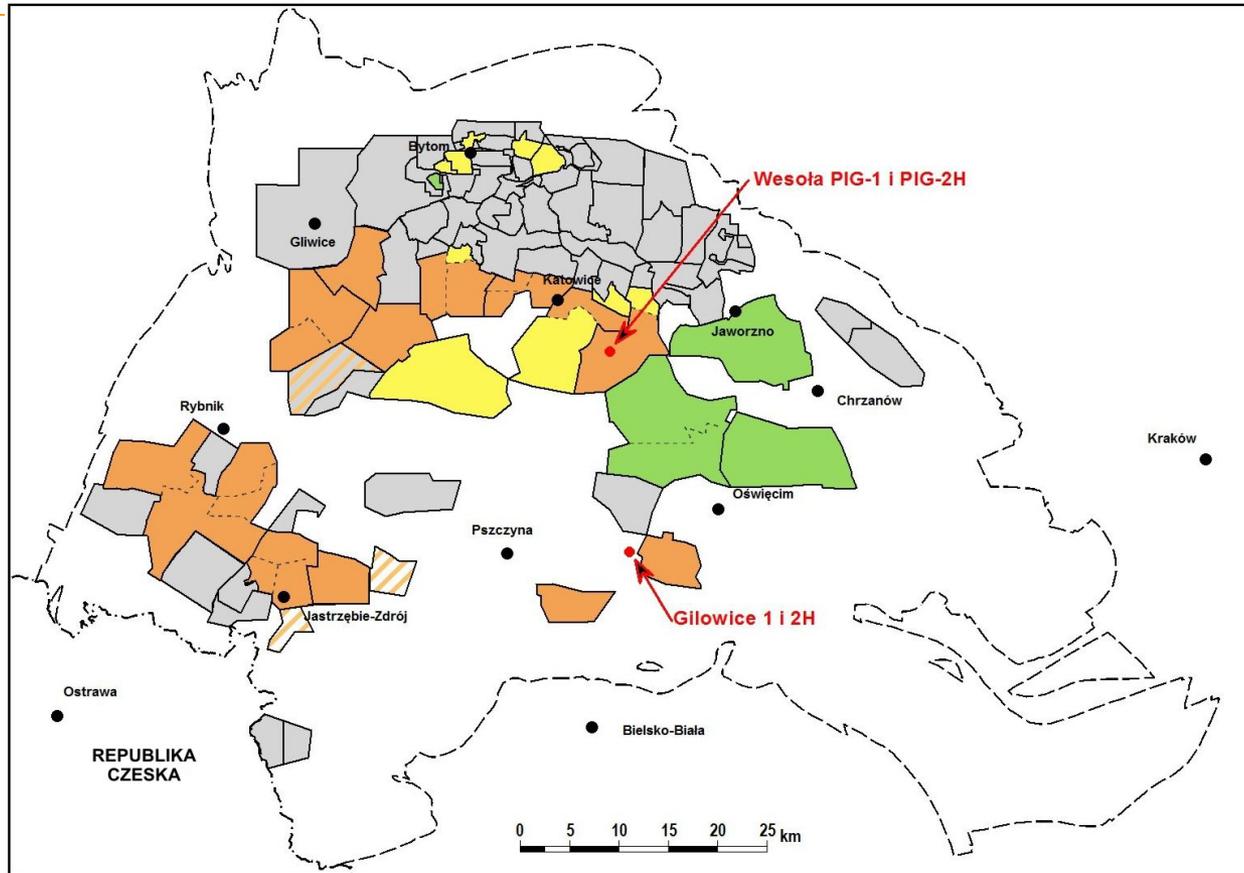


Polish coal basins and reserves



- ❑ Resources: 56,220.48 Mt
- ❑ Economic resources: 3,573.69Mt
- ❑ Production – 65.5 Mt,
 - 53.0 Mt Steam coal,
 - 12.5 Mt Coking coal
- ❑ Number of hard coal mines – 21(32 plants)
- ❑ Hard coal companies:
 - Polska Grupa Górnicza
 - Jastrzębska Spółka Węglowa
 - Węglkoks 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 82,700 workers

Hard coal mines in Upper Silesia Basin



 gassy coal mines with degasification

 gassy coal mines without degasification

 non-gassy coal mines

 closed mines

 mines under construction

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 2017

- For 21 hard coal mines only 5 are not considered gassy-ones.
- In 13 coal mines drainage of the coal seams was carried out – by 20 surface and 2 underground methane drainage station plants

Methane in Polish coal mines

- 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.**



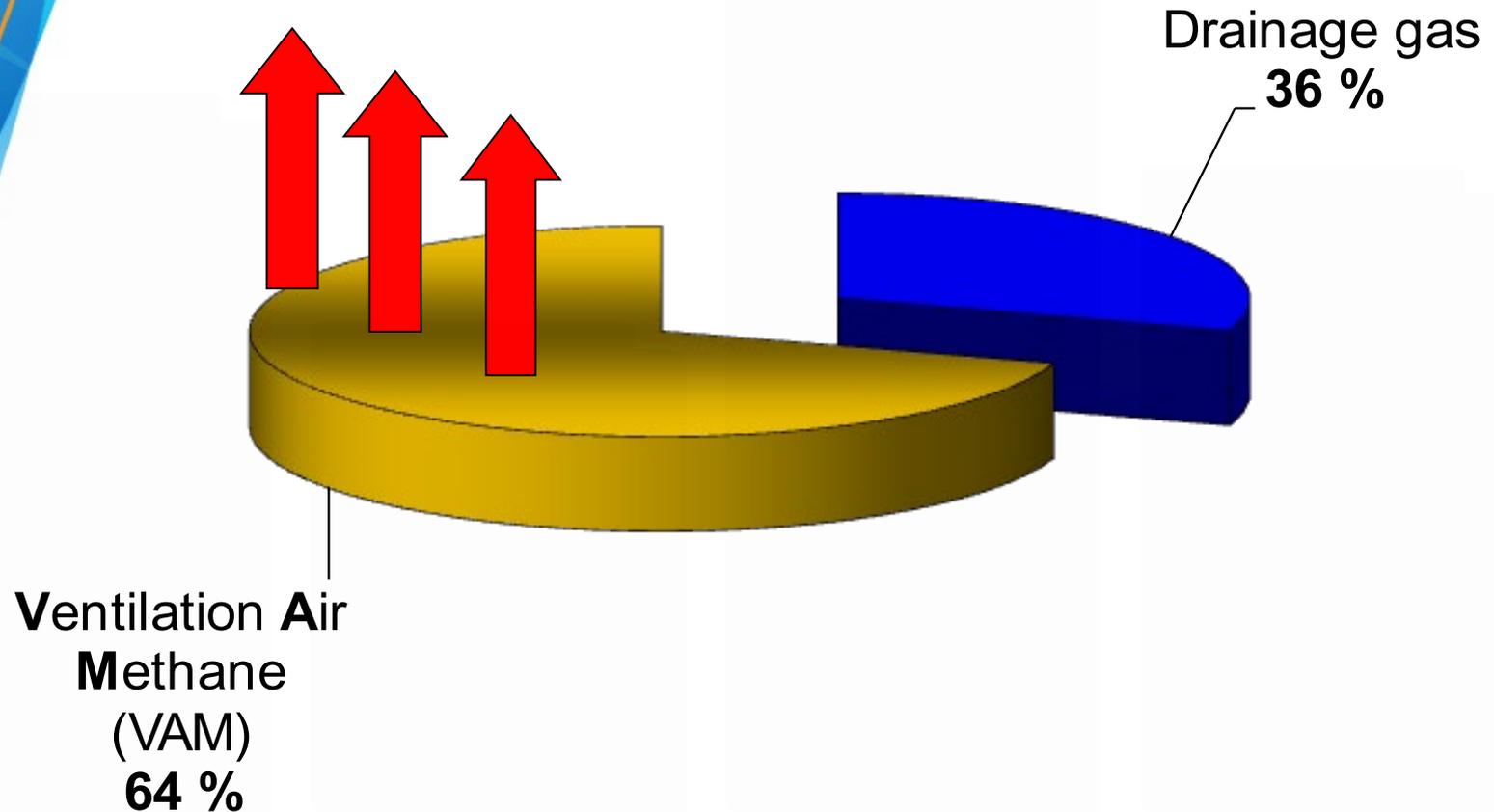
CBM/CMM potential in Poland

Specification	Year										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Absolute methane bearing capacity (mln m ³ /year)	878.9	880.9	855.7	834.9	828.8	828.2	847.8	891.2	933.0	933.8	948.5
Methane drainage (mln m ³ /year)	268.8	274.2	259.8	255.9	250.2	266.7	276.6	321.1	339	342.1	337
Amount of economically utilized methane (mln m ³ /year)	165.7	156.5	159.5	161.1	166.3	178.6	187.7	211.4	197.1	195	212
Number of the hard coal mines	31	31	31	32	31	31	30	30	31	23	21
Hard coal output (mln tones)	87.4	83.6	77.3	76.1	75.5	79.2	76.5	72.5	72.2	70.4	65.5

72.0 mln tones

Total gas released during mining operations

(about 948.5 mln m³) 933.8 mln m³ in 2016



Methods of methane drainage in Poland:

- **drainage of the coal seams ahead of mining (before exploitation),**
- **drainage during coal exploitation,**
- **drainage of goaves.**

Poland Coal Sector Update

- 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!
- ✓ **Long term CBM project „Geo-Metan”**

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

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