XXIX School of Underground Mining
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# Polish Regulations Pertaining to AMM Capture and Utilization

# Examples of AMM Projects in Poland

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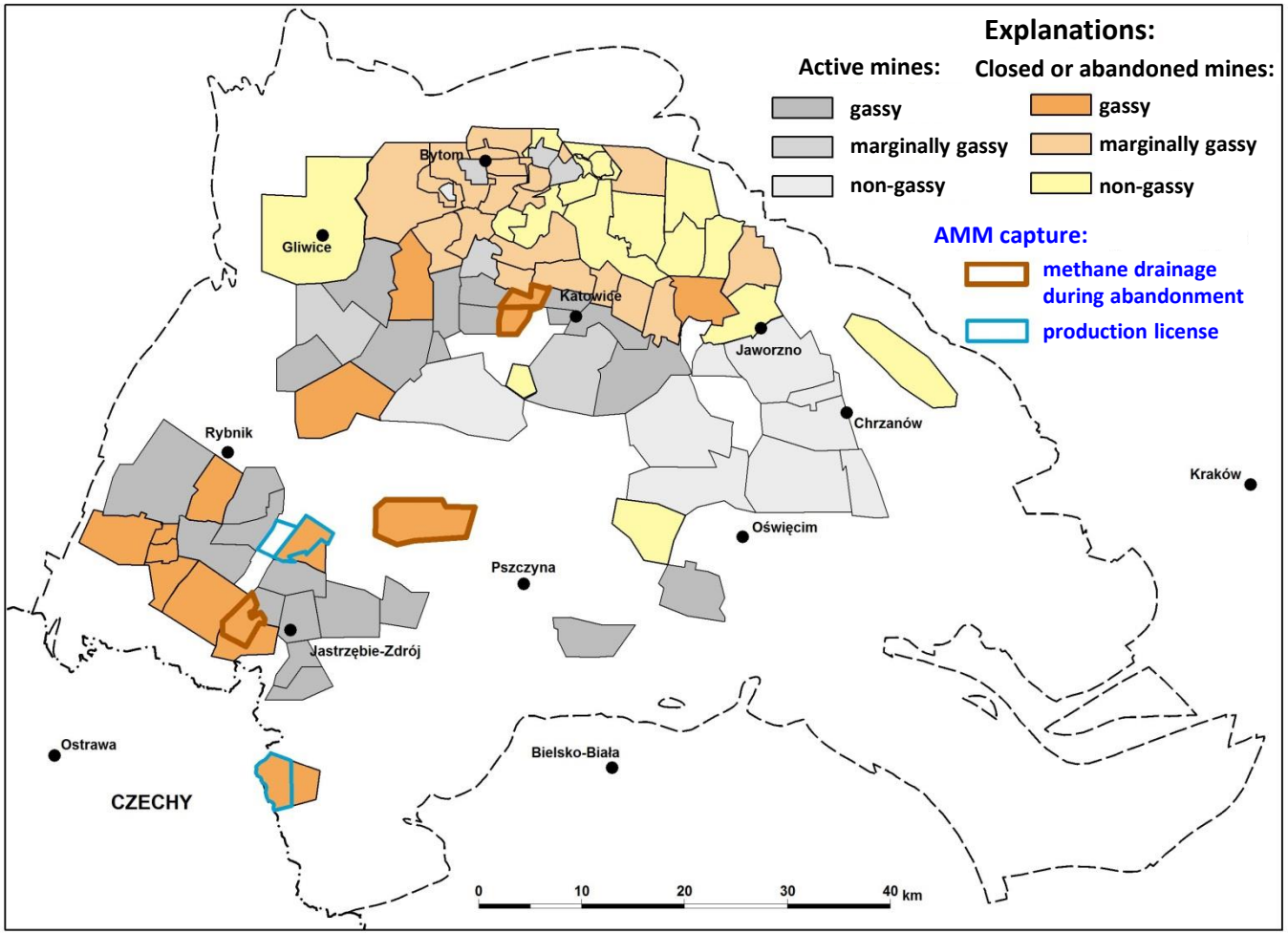
# Abandoned Mine Methane Potential in the Upper Silesian Coal Basin




- Several closed or abandoned mines are gassy.
- Gas is commercially produced from 2 abandoned mines, while methane drainage is still carried out in the three recently closed mines.
- Most of the active mines are gassy and will become increasingly gassy with increasing depth of mining.





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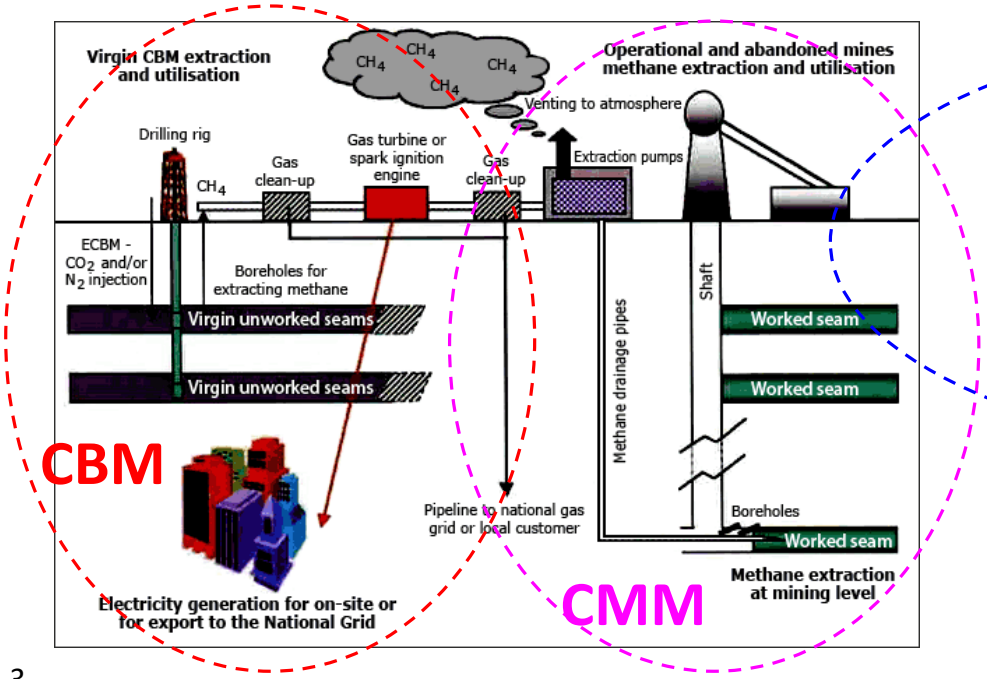
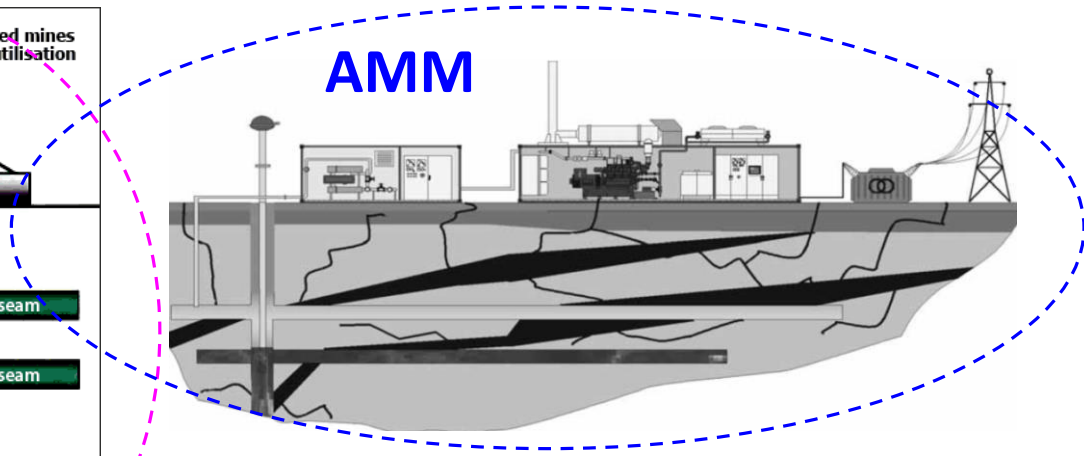
# International Terms Related to Gas Produced from Coalbeds

- **Coalbed Methane (CBM or VSBM) or Coal Seam Gas (CSG) – coalbed methane, this term refers to methane recovered from un-mined coal seams using surface boreholes; high methane gas;**
- **Coal Mine Methane (CMM) – gas released during coal mining process, can be captured by underground methane drainage techniques or gob wells; gas heavily contaminated with air;**
- **Abandoned Mine Methane (AMM) – gas released from closed and sealed mines and produced using surface wells to gob zones; usually variable methane contents (up to 90%).**



# Regulatory Framework for CBM and CMM Production in Poland



**Polish Terms Related to Coalbed Methane Resources/Reserves:**

- **Coalbed Methane – any methane gas originated from coal seams;**
- **Secondary subdivision (with regard to resources/reserves evaluation and licensing process):**
  - **Coalbed methane designated as ”main mineral” = CBM (including AMM)**
  - **Coalbed methane designated as ”accompanying mineral” = CMM**

- **<u>Geological and Mining Law</u> (GML) governs mineral exploration and production activities as well as resource/reserves evaluation, including petroleum.**
- **Competent authority – <u>The Minister of the Environment</u>.**
- **CBM is classified as petroleum – <u>regulations for petroleum are applicable</u>.**
- **CMM is excluded from petroleum (and is related to coal) – regulations for solid minerals are applicable.**

# Procedures of Obtaining a License for Petroleum Exploration and Production / Petroleum Production

www.pgi.gov.pl

**Prequalification procedure**

(related to national security interests) – performed by the Minister of the Environment in cooperation with the Head of the Internal Security Agency and the Head of the Intelligence Agency

***Petroleum exploration and production license tender***

| **Annual bid round** *initiated by the Ministry of the Environment* | **„Open door" type tender** *initiated by a potential license operator* |
|---|---|


*Other requirements for the license issuance:*

- ✓ **Opinion of local authorities**
- ✓ **Establishment of financial collateral** guaranteeing fulfillment of the license requirements (monetary value is up to 20% of the operational expenses)

| **Petroleum exploration and production license** *valid for 10 to 30 years with 5 year exploration phase* | **Petroleum production license** *(additional requirements are applicable)* |
|---|---|

**Mining Usufruct**

established in order to guarantee the petroleum rights for the license holder

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# Permitting Requirements for CBM/AMM Production under a License

***AMM gas may be produced:***

- ***under a CBM production license,***
- ***under a CBM exploration and production license:***
  - ✓ ***during a production phase,***
  - ✓ ***during an exploration phase gas recovered from flow tests may be utilized for up to 2 years.***

## *Permitting process:*

**Geological-Investment Report (of a CBM deposit) approved by the Minister of the Environment**

specifies CBM resources and reserves, field development plan, the mining area and mining terrain boundaries

↓

**Investment decision**

issued by the Minister of the Environment before the commencement of a production phase of a CBM exploration and production license (does not apply to a production license)

↓

**Environmental Decision**

**Compliance with the Local Spatial Development Plan**
verified by local authorities

**The consent of the Minister of the National Assets**

↓

**Operational Plan (Plan Ruchu) approved by the District Mining Authorities**

prepared by the Mining Company dedicated for gas field development executed.

# Payments for AMM Production Activity

| Payment type | Monetary value [PLN] |
|---|---|
| Application fee for the prequalification procedures [PLN] | 1112 ($^1/_4$ of the National Average Salary) |
| Exploration fee [PLN/km2] | 229 |
| Exploitation fee (royalties) [PLN/m3] | 0 |
| Mining Usufruct fee for exploration | Area of the field x Exploration Fee |
| Mining Usufruct fee for gas production (minimum – it is established in the tender) | 0,005% of the reserves monetary value per year |

# Specific Regulations for AMM due to Safety and Environmental Concerns

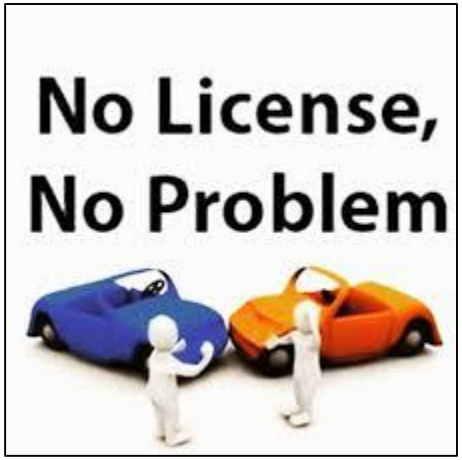
- When the coal mining is terminated, coal production license as well as CMM rights expire and the mine is taken over by the Mine Restructuring Company (SRK) which is responsible for a process of mine abandoning.

- In December 2016 the new regulation was introduced, which allows SRK to produce coal mine gas without a license for the duration of a mine abandonment process.

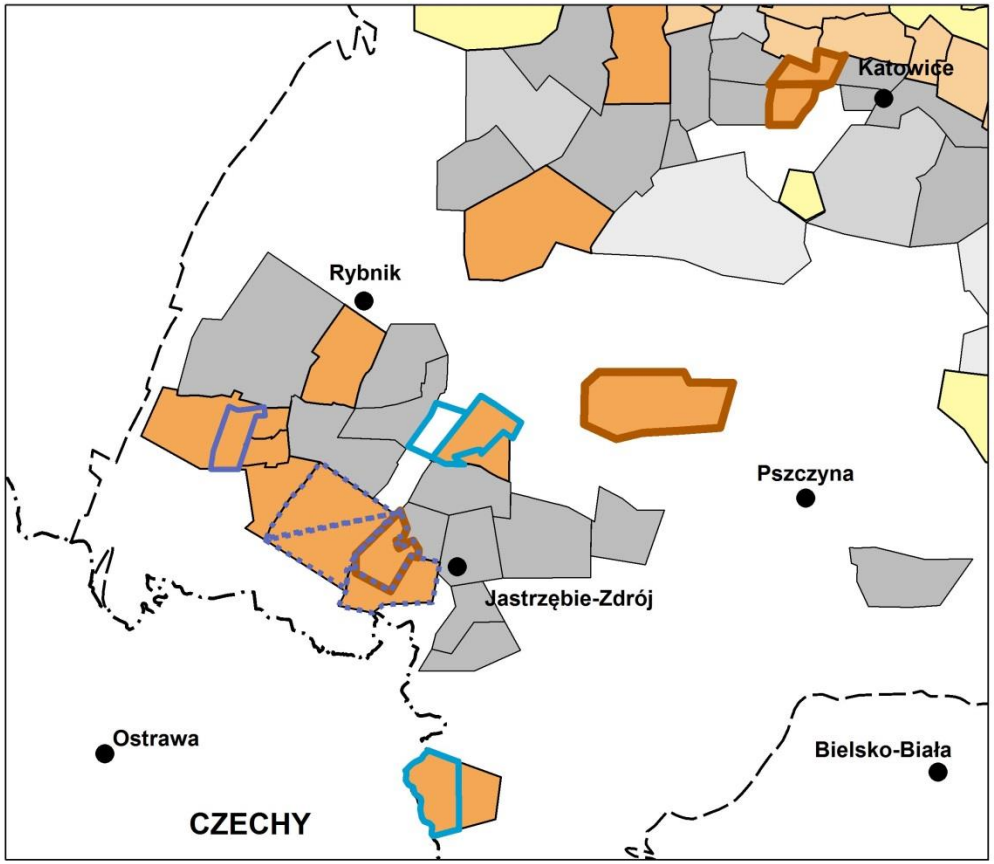
- The rationale for this regulation is to ensure operational safety during the mine abandonment process and safety of the adjacent coal mines, as well as to prevent fugitive emissions of methane.

- SRK uses the existing in-mine drainage facilities for methane capture.

- SRK has carried out methane drainage for three recently closed mines, with total recovery of 25 million $m^3$ of methane in 2018.



# AMM Production and License Activities in the Upper Silesian Basin




**Explanations:**

**Active mines:**
- gassy
- marginally gassy
- non-gassy

**Closed and abandoned mines:**
- gassy
- marginally gassy
- non-gassy

**AMM production and licenses:**
- methane drainage during the abandonment process by SRK
- production licenses
- exploration license
- license applications

***AMM licenses in the Upper Silesian Coal Basin***

| CBM deposit | License type | Start date | Expiry date |
|---|---|---|---|
| **Żory 1** | **Production** | **2011-10-31** | **2031-10-31** |
| **Jankowice Wschód** | **Production** | **2016-03-14** | **2031-03-14** |
| **Kaczyce I** | **Exploration & Production** | **2000-01-28** | **2023-01-28** |
| **Anna** | Exploration | **2016-05-11** | **2021-05-11** |
| **Wilchwy** | Application | **-** | **-** |
| **Mszana** | Application | **-** | **-** |

***AMM production in the Upper Silesian Coal Basin***

| CBM/coal deposit | License type | Recoverable Resources (2018) [million m$^3$] | Reserves (2018) [million m$^3$] | Production of methane per year [million m$^3$] | |
|---|---|---|---|---|---|
| | | | | 2017 | 2018 |
| **Kaczyce I** | Exploration & Production | **38,87** | **6,22** | **2,29** | **1,25** |
| **Żory 1** | Production | **124,47** | **77,73** | **3,25** | **3,33** |
| **Jankowice Wschód** | Production | **15,83** | **15,57** | **1,93** | **0,64** |
| **Krupiński** | SRK | **-** | **-** | **28,54** | **15,51** |
| **Jas-Mos** | SRK | **-** | **-** | **7,59** | **8,73** |
| **Śląsk** | SRK | **-** | **-** | **-** | **1,41** |

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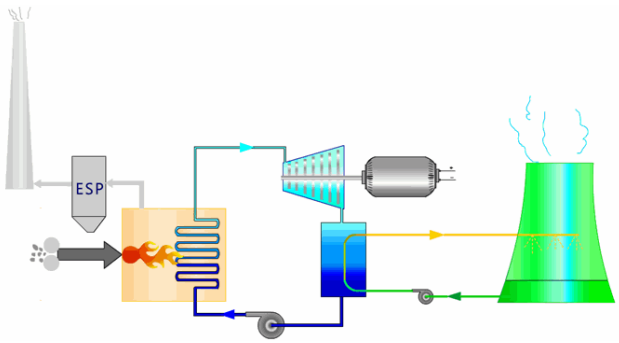
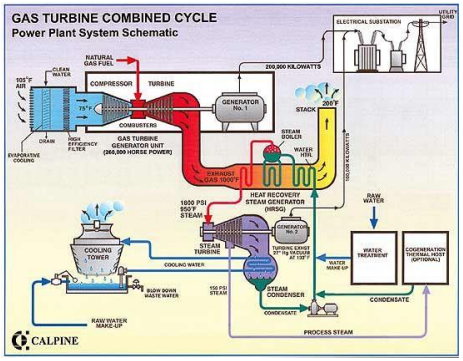
# AMM Utilization in Poland

- Abandoned Mine Methane is commonly utilized for power generation or cogeneration of power and heat.
- The regulations applicable for AMM utilization are the Energy Law and the Act concerning Renewable Energy Sources.
- License types: electricity/ energy from renewable energy source/ power and heat (cogeneration).
- Competent authority for the license issuance: President of the Energy Regulatory Office.
- A process of obtaining a power generation license is lengthy and complicated.
- Incentive schemes for highly efficient cogeneration has been implemented by the state (mainly dedicated to CMM, less effective for AMM due to operational costs):
  - ✓ violet certificates until the year 2019;
  - ✓ cogeneration premium scheme introduced by the new law, effective as of 1st January 2020.

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# Summary and Recommendations

- There is a significant potential of AMM capture and utilization in Poland.
- The Polish mining industry is not well prepared for increasing AMM production due to a long abandonment process combined with lengthy and complicated procedures for obtaining a petroleum production license as well as a power generation license.
- The matter is further complicated due to lack of a robust AMM reserves estimation method combined with the fact that most abandoned mines are connected to active mines.
- The best results can be achieved by planning AMM production and utilization activities well in advance of the mine closure.
- Modifications of the existing regulations are required, e.g. AMM exploration and production should not fall under a stringent petroleum regulation regime.
- There are incentives provided by the state for AMM production (no royalties and other payments are fairly low) as well as for utilization AMM (high efficiency cogeneration premium – new regulation effective as of 1st January 2020), but these incentives may still be insufficient for commercial AMM development.