

Coal Mine Methane

Management & Utilisation



From safety risk to clean energy

Methane from coal deposits is known under a variety of names, such as Firedamp, Coal Bed Methane (CBM), Coal Mine Methane (CMM), Abandoned Mine Methane (AMM) or Ventilation Air Methane (VAM). In any case, it's all about methane or short CH₄. While the mining industry is primarily interested in removing methane for safety reasons, the gas and power industry regards this medium as a “new” source of energy to meet growing demand. All parties share a basic intention: achieving maximum profit through handling the gas in whatever way.

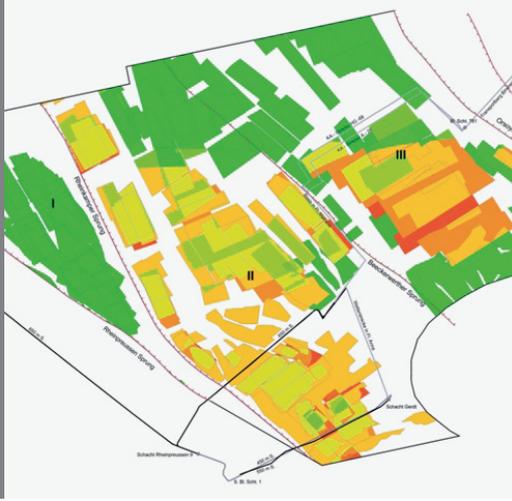


Abandoned mine methane power plant “Hugo Ost”, Germany

That, however, is not as simple as it sounds. DMT has developed a practically relevant system for the management and utilisation of methane in three steps, all of which have to be combined to achieve the best results for a workable, cost efficient methane utilisation operation.

Summary of DMT benefits

- DMT has its roots at one of the most complex coal deposits in the world
- DMT has been cooperating with the coal industry for more than 150 years
- DMT has been supporting international companies in exploration, mine safety and gas utilisation all over the world
- DMT holds a wide range of in-depth knowledge of mining, gas recovery and gas utilisation
- DMT offers consultancy and engineering services based on know-how and experience



Know-how for profit in 3 steps

Normally the special interests of the various industries affected by methane – e.g. coal mining, gas production, investment and environmental protection – seem to collide. Gas quantities and qualities are influenced by the mining and degassing process and therefore seldom stable. The market for mine gas is sometimes confusing, influenced by local prices for gas, power, heat and carbon credits. Additionally, legislation influences several aspects of environmental protection, mine safety and support of unconventional energy.

In three steps DMT leads these multiple “problems” to a sustainable target by using the full energy held by coal deposits while ensuring mine safety and climate protection.

Exploration

Miners and investors are faced with the same major questions concerning the quantities and qualities of methane resources as well as the methods and costs of extraction. DMT faces these different requirements by assessing and modelling the geological deposit, performing a feasibility study and planning the mine and gas drainage layout.

Depending on the resources and kind of operation, for example:

- introducing pre-mining or post-mining gas drainage,
- improving mine safety and mine productivity,
- producing electricity with gas from active or abandoned mines,
- protecting against climate change,

the experts of DMT can evaluate the methane resources, model potential gas flow rates, identify optimum extraction and drilling sites and provide planning and technical support for the drilling phase. One result of our exploration is fixed in advance: Reliability.

Improvement

Sources of gas emissions differ from mine to mine, depending on geology and applied mining technology. There is no general solution for gas capture. Efficient gas drainage provides advan-

tages for both safe, high performance mining and efficient gas utilisation. All gas captured before mining reduces the risk of gas outbursts and capturing gas before it enters the ventilation air minimises explosion risks. Nevertheless, safe mining is also possible with high gas contents when a proper safety concept is applied. DMT is able to assist in this respect. Ongoing improvement of gas drainage is developed from two angles: achieving coal production targets and maximum safety first, and producing an additional product – usable gas – as a second goal.

Utilisation

Improving a gas extraction and ventilation system properly will not only increase work safety; the methane can also be used for heating or cooling purposes or to produce electrical energy. When handling CMM and AMM, reliable predictions and planning are required. Gas engines, for example, need a stable supply of qualitative, clean and dry gas for smooth and hardwearing operation. Our engineers would be delighted to design and plan the methane utilisation system for your individual requirements, with a close look at regulations, laws and environmental needs.

Selected references

Client	Project
RWE Power AG	Evaluation of gas emissions of twenty-one coal mines in China (ShanXi, HeiLongJiang, NingXia, NeiMongol provinces), in Russia (Kuzbass) and in Ukraine (Donbass) for the development of CMM and VAM recovery and utilisation projects
MTM Capital Partners Ltd.	Investigation of twenty-five Chinese coal mines (GuiZhou, YunNan, ShanXi, AnHui, Chong-Qing provinces) with evaluation of gas drainage rates for the development of CMM recovery and utilisation projects, recommendations for system optimisation
Minegas GmbH	Evaluation of gas potential and production forecast at more than fifteen AMM production sites in Germany, planning and supervising of six gas drillings, work and explosion safety concepts, authorisation management
European Gas Ltd.	Evaluation of gas reserves and production forecast for different AMM and CBM licenses and production sites in the Nord-Pas de Calais, Lorraine, St Etienne and Gardanne basins in France, gas content, permeability and porosity tests, borehole logging for CBM wells
Arcelor Mittal	Supply of laboratory for gas content and sorption isotherm measurement incl. set up and training at Kazakhstan coal mine operations, consultancy for gas outburst prevention, assessment of gas outburst
DTEK	Assessment of entire gas drainage system at Komsomolets Donbassa Coal Mine (Ukraine), recommendations for improvement of ventilation, borehole layout, gas drainage system and gas utilisation
MIMOSA	Assessment of gas outbursts at Mexican mines, recommendations for establishment and improvement of gas outburst management, laboratory testing of gas contents and desorption characteristics
RAG Group	Engineering, consultancy, inspection, research & development in the areas of gas drainage, ventilation, monitoring, gas outburst prevention, specialist training of engineers and staff, cooperation & coordination with mining authorities

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