

## UNECE Ad Hoc Group of Experts on Coal Mine Methane.

### Response to Misconceptions about Coal Mine Methane Projects.

Within the framework of the United Nations Economic Commission for Europe (UNECE), member states have formed an Ad Hoc Group of Experts (AHGE) for Coal Mine Methane (CMM), comprised of over 200 individuals from governments, industry, investors, and international and intergovernmental organizations, which meets regularly and addresses mine safety issues and methane emission reduction potential.

At its most recent meeting on 16-17 October 2008, the AHGE discussed misconceptions about CMM projects worldwide, due at least in part to the perceived slow progress of such projects through the project-based “Flexible Mechanisms” of the Kyoto Protocol. There have been several publications addressing the “under-delivery” of carbon credits from CMM projects<sup>1</sup>, raising concerns in the carbon credit market about reliable carbon credit supplies from these projects.

Ten main points of concern that have been raised are<sup>2</sup>:

1. Only about 10 of more than 60 CMM projects have been registered by the Clean Development Mechanism Executive Board (CDM EB) to date, which questions the role of carbon credits from this sector as a major source of supply.
2. The technology used is relatively new, expensive and complicated.
3. There are strict rules about the concentration of the gas that can be used.
4. Mining companies direct most of their money towards their core activity of mining, with money from CDM projects being only a minor revenue stream at most mines.
5. Project Design Documents (PDDs) tend to be overoptimistic about future emission reductions as demonstrated by lower credit issuance levels than projected in PDDs.
6. Forecasting of emission reductions is very difficult.
7. Monitoring of CMM projects is perceived to be more complex than for other CDM projects.
8. Audits by third-party verification companies can be time consuming.
9. Methane content of CMM differs widely from one mine to another and even within one particular project.
10. Higher risk exists for CMM projects than for most other project types because of the imperative for mine safety and real and perceived safety risks, both from an operational as well as from a reputational perspective.

Like projects from other industry sectors, CMM projects have faced many challenges as the CDM process has developed. The Bureau of the AHGE appreciates the opportunity to offer guidance on the above points which the Bureau believes are based partly on anecdotal evidence instead of a full understanding of CMM projects.

#### 1. Low number of projects registered:

True. Not only is the registration quota poor, so is the number of total projects submitted for registration, given the large volume of methane emissions from coal mines. In this context it has to be noted that China is the host country for probably more than 95% of possible CMM projects within the CDM framework. Other large CMM markets are mainly Joint Implementation (JI) countries. Therefore when it comes to assessing the total number of

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<sup>1</sup> e.g., Point Carbon, 4 September 2008, “Coalmine projects make slow progress through CDM”

<sup>2</sup> In the order in which they appear in the Point Carbon article

CMM CDM projects submitted, one has to look at the state of project development in China. With the exception of a few flagship projects, the Chinese CMM market is dominated by a “do-it-yourself” approach with international companies acting as buyers of Certified Emission Reductions (CERs) but with those companies having limited influence on project execution and operations. If a coal mine operator is not funding and managing the CMM project properly, the project will inevitably get delayed, postponed or even fail to be implemented. Further, the majority of methane emissions from Chinese coal mine drainage systems are in or near explosive concentrations. Besides raising serious mine safety concerns, this makes utilisation either impossible, when adhering to international safety standards, or unreliable, due to complications in safely transporting and handling explosive gas mixtures when in default of such standards.

The Bureau believes that the low registration rate by the CDM EB might be due to a lack of understanding of the specifics of CMM projects making it difficult for the CDM EB to assess baselines and additionality. We believe this is not necessary, as the CDM EB should be able to rely on the validation report. To a lesser extent, some PDDs lack consistency and clarity, leading to a more time-consuming project review process.

2. New and difficult technologies:

False for the utilisation of CMM from drainage systems, but partially true for the utilisation of ventilation air methane (VAM). CMM from drainage systems producing a concentration of 30% methane or more in air can be used in CHP power plants, boilers, flares or can be upgraded to pipeline quality etc. These technologies are mature and proven over many years in many countries. The Methane to Markets Partnership has catalogued over 200 existing CMM and abandoned mine methane projects, almost all of which use conventional technologies. The CMM-handling can be challenging, but this is a management issue not a technology one.

The core technologies for utilisation of VAM, such as flameless oxidation, are mature as well, however their application for VAM utilisation is relatively new and expensive when compared to CMM utilisation. However, regulatory barriers, rather than technical barriers, have been a greater hindrance to deployment. With an active commercial operation in Australia and commercial deployment underway in the US, regulatory concerns have been addressed and there are several projects in the planning stages.

3. Strict rules on methane concentration:

True. The rules governing the permitted concentration of methane in air in most countries are driven by the physical properties of gas mixtures of methane in air. Common international practice prohibits the transportation and utilisation of gas mixtures within the explosive range including a safety margin. These limits are country specific and range from 1% to 25-30% of methane in air under ambient conditions. These restrictions apply not only for CMM but for any gas mixture of methane in air.

4. Methane projects non-core and small for miners:

True. CMM utilisation projects are very small when compared to the scale of coal extraction and are outside the core business of coal companies. However, safe gas extraction is in the best interests of the operators of any gassy coal mine because it enables them to maximise coal production. There are many companies in the market with the expertise and experience needed, and some are willing to fund CMM projects. Coal companies could outsource this activity and benefit not only by receiving value from the CMM, which they have to manage anyway due to safety and productivity considerations, in addition to the benefits accrued by preserving the environment. This in fact is the spirit of Flexible Mechanisms, whereby outside investors desiring to offset emissions supply capital, technology and know-how in exchange for carbon credits. The general trend toward do-it-yourself projects is a significant departure from the original intent, and becomes a basis for criticism that the process could become a subsidy for business as usual.

5. Overoptimistic Project Design Documents:

True. Very often, PDDs rely on point estimates of CMM production provided by the mine operators and a detailed resource assessment is often omitted. Furthermore, fluctuations in CMM quantity and quality can lead to downtimes or even to over-sizing of the utilisation system. Some PDDs estimate operating hours for power generation projects to be above 8400 hours per year, a figure which is unlikely to be achieved by most CMM projects. Sometimes the technology employed lacks the characteristic of reliable and constant operations, for example if gas treatment is omitted or if heating systems supply only seasonal demand. The AHGE recommends conducting a detailed technical feasibility study addressing the CMM resource and technology to be used on an individual project level. A PDD is not intended to, and indeed cannot, replace a detailed technical review of a particular project. Surprisingly few PDD's are written by project developers or technology providers that possess the know-how and experience to make judgements as to how appropriate a technology is for a given situation.

6. Forecasting emission reductions is difficult:

False. Coal mine operations demand high levels of investment and investors put great emphasis on the technical feasibility and the accuracy of coal production forecasts. Generally a mine plan exists which gives all information needed for a reliable gas production forecast to be made. Forecasting of emission reduction is only then difficult if the coal mining operations and forecasts are not taken into consideration. For example, longwall changeovers, which every mine must plan, have an impact on gas availability, as well as other operating specifics of a particular coal mine. Without this knowledge, forecasts of emission reductions become impossible.

7. Monitoring is more complicated:

False. To measure emission reductions from coal mines means knowing the quantity and quality of the emissions avoided, e.g. the emissions used or destroyed. As in any project activity this requires a "fit for purpose" and well-maintained monitoring design and system. Monitoring plans generally require that data be acquired and maintained for audit at a later date, much of which may be accomplished by automated systems. However this is not a substitute for oversight by dedicated and well trained operators. Technology transfer is in fact only one of the aims of the Flexible Mechanisms and capacity building is another. Too often this part of the intent is overlooked and results in poor project implementation and operation.

8. Auditors find validation/verification too complicated:

True. Validators and verifiers generally are not experts in associated coal mining activities. However, a reliable and straightforward monitoring system should allow for a more timely verification process. Perhaps one solution would be for validators and verifiers to seek outside specific technical expertise or develop such expertise in house. Sector specific coursework is becoming available and the Bureau recommends that some sort of sector-specific technical background be required.

9. Methane content varies considerably:

True. Every coal mine is different and when it comes to drainage of CMM, no single standard would be universally applicable. Even within one coal mine, gas quality fluctuations occur daily or even more frequently. However, modern utilisation equipment, for example gas engines, is designed to deal with different methane concentrations and can adapt to fluctuations as fast as they occur. If CMM is distributed via pipeline, as is the practice in some countries, fluctuations are less likely to occur because the pipeline acts as a mixing and storage tank. In addition, in many countries which may become hosts to the flexible mechanism projects, standard gas drainage protocols are employed. This results in sub-optimum production of gas with fluctuating quality. Project developers should look up-stream to determine what additional measures may be taken to improve delivery of a reliable fuel source. This is particularly critical factor that should be considered in China where, as has been mentioned, much of the gas produced, remains unused because it is low concentration methane that is dangerous to transport and use.

#### 10. Safety risks of CMM:

True. Just as hydro projects depend on hydro geology and weather, wind projects depend on wind patterns, landfill gas projects depend on professionally-managed landfills, CMM projects depend on the gas supply from a coal mine, which is gas that is vacated from the mine primarily for health and safety reasons. However, coal mine methane projects are not unique in this regard; most CDM activities rely on circumstances which are beyond the control of the project sponsor who therefore cannot control the risks. Actually one can argue that CMM projects are less risky because safe gas supply can be managed – more than some other natural resources such as wind and hydro.

Reputational risk is an issue, however, because despite the fact that a particular utilisation project is separate from, and does not interfere with, mine safety (as long as it utilises safe CMM), the CMM project's reputation might be damaged if a gas-related accident occurs.

The Bureau believes that the main reason for under-delivery of carbon credits from CMM projects is a lack of integration of the mine drainage operations with the utilisation project. Many hundred megawatts (MW) of installed power generating capacity is now fuelled by CMM, along with other uses for CMM in countries like the US, Australia, Germany, UK, and the Czech Republic are proof that under-delivery of emission reductions is not inevitable.

We also acknowledge a confusion of industry-specific acronyms, such as Coal Bed Methane (CBM), Coal Seam Methane (CSM), Coal Mine methane (CMM), pre-drainage and so on. In an attempt to avoid this, the AHGE published a glossary of terms specific to the CMM industry which can be found on the UNECE website

([http://www.unece.org/energy/se/pdfs/cmm/cmm4/ECE.ENERGY.GE.4.2008.3\\_e.pdf](http://www.unece.org/energy/se/pdfs/cmm/cmm4/ECE.ENERGY.GE.4.2008.3_e.pdf)). In addition, the AHGE has also developed other valuable specific information on CMM, such as the results of a worldwide survey on the main issues, opportunities and obstacles associated with CMM projects

([http://www.unece.org/energy/se/pdfs/cmm/cmm3/ECE.ENERGY.GE.4.2007.3\\_e.pdf](http://www.unece.org/energy/se/pdfs/cmm/cmm3/ECE.ENERGY.GE.4.2007.3_e.pdf)), and case studies that illustrate the need to understand the relation of coal mining economics and employing best practices to keep the miners safe while extracting and beneficially using Methane ([ECE/ENERGY/GE.4/2007/8](http://www.unece.org/energy/se/pdfs/cmm/cmm3/ECE.ENERGY.GE.4.2007.8_e.pdf) and [ECE/ENERGY/GE.4/2007/9](http://www.unece.org/energy/se/pdfs/cmm/cmm3/ECE.ENERGY.GE.4.2007.9_e.pdf)).

A task group sponsored by World Coal Institute (WCI), UNECE and Methane to Markets (M2M) is collating the skills, attitudes, concepts and knowledge accumulated by CMM practitioners and managers in every coal-producing country over the last five or six decades. The group will produce a "Best Practices" handbook that it hopes will be adopted by CMM operators around the world, and which will lead to a set of international safety and efficiency standards against which every CMM project and CMM PDD can be evaluated.

We sincerely hope that this letter successfully addresses some of the market's misconceptions about CMM projects and that we have been able to instil more confidence in the manageability of these projects. There is no doubt that CMM projects have an enormous potential for emission reductions. To access this potential is perfectly possible by employing the expertise available in the market place and by taking into account the needs and specifics of coal mining operations, especially gas-related coal mine safety. We invite all those who are interested in CMM projects to join the AHGE, review our website (<http://www.unece.org/energy/se/cmm.html>) and participate in our meetings and workshops.

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