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For the attention of Rachel Tornek
Climate Action Registry

Comments to Public Draft of Coal Mine Methane Protocol

We would like to thank CCAR for the opportunity to provide comment to their development of the Protocol. CCAR has written a common sense and practical protocol, with real potential for an outcome of significant environmental benefit.

We were particularly impressed with the manner in which the consultation exercise was handled, efficiently managed, yet with an informal approach, and with all interested parties having been given a platform for comment and input.

A list of our comments is provided below:-

Section 2 Project Definition Page 47
We feel that there is a lack of clarity surrounding definitions of what constitutes operating and closed mines.
We would recommend that the definition would tally with other recognised thresholds in time, possibly as defined by MSHA. We are unfamiliar with the appropriate definitions in the USA for these closure / change of state thresholds, but the definitions within the protocol are not sufficiently clear at this time.
We would consider it sensible to allow that any mine, whether producing mineral or not, is considered to be an operating mine where it is ventilated.
Further we would consider that any part of a disused mine, which is connected underground to an operating mine, and which requires drainage of methane from that disused mine for the safety of the operating mine, is also considered to be part of the operating mine.

Section 3.4.1 The Regulatory Test

This subject is of significant importance to the success of the protocol in enabling investment in methane abatement technologies.

We are in a political situation where methane emissions from coal mines may be dealt with in one of two ways, either as part of a cap and trade system, or via a regulatory compliance (including taxation) system.

By terminating any project crediting period at the point of newly introduced regulation, the Protocol effectively places very significant risk on an investor, who requires a return over a known period. This is an unacceptable risk for any investor.

Regulatory compliance requirements for abatement of coal mine methane are difficult to specify, as there are such close links to the safety implications of any such abatement installation, and with potentially huge consequences. It is also difficult to determine where the threshold for abatement should exist, in terms of both flow and concentration (either in VAM or CMM). For this reason, internationally, Regulatory bodies have to date, wisely shied away from compliance and leaned toward encouraging investment through carbon trading mechanisms. In the medium term, it is expected that development of practical and cost effective technological solutions will have evolved, having been encouraged through the private sector investments enabled through such protocols as being discussed here.

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It is fair to state that we are at least some years away from a compliance situation for VAM or CMM (for the technical reasons given above and to allow for programme constraints involved in administration of Government due process), and it is clearly the right course to encourage private sector investment in methane mitigation in the medium term.

It is imperative to tackle methane emission quickly. Estimates of the GWP of methane are 62 over a 20 year horizon, 23 over 100 years, and 7 over 500 years (Albritton and Miera Filho, 2001, pg 47). Methane emissions from coal mining represent up to 15% (GWP 62) of lifecycle emissions created by power generation from coal. We cannot afford to wait for compliance legislation so we must have investment and the rapid technological advances brought on by privately funded commercial encouragement.

Due to the high capital costs, significant operating costs and the technology risk involved in VAM abatement, CMM power generation and CMM abatement through flaring, investors require a fixed investment period against a suitable price of carbon. The current price of carbon (through this particular mechanism) requires an investment period of 10 years or more.

Harworth Energy has seen the effect of uncertainty on carbon mechanism and investment period in both China and the CIS. In both regions, most investment activity in CMM and VAM dropped off dramatically during 2008, despite a relatively high carbon price due to the post 2012 uncertainty in CDM. This uncertainty is a severe risk to investors, and in the gap between mechanisms, large quantities of methane are being emitted to atmosphere directly as a consequence of this uncertainty.

As part of the UK Emissions Trading Scheme, methane was included as a greenhouse gas, and investment in abatement was incentivised. At the end of this scheme, in the rush to create a larger EU ETS, methane was left out of the gasses considered, and we are still waiting to see what the regulatory authorities recommend in the future in the next phase. It is likely that CMM will be overlooked again. The CMM abatement equipment which was procured and paid for by carbon trading during the UK ETS, ran for four years, then was switched off at the end of the scheme, and will remain switched off until government administration reaches conclusion on methane emissions from mines (equipment has been idle for four years). Our point of argument is that understanding and implementing laws takes a lot of time, and this time delay will impact investment and therefore methane emission mitigation.

It is possible to argue that a mine should invest in mitigation equipment and take whatever commercial benefit accrues from carbon trading until such time as compliance is required. It should be recognised that coal mines are not typically the investor in carbon mitigation schemes, coal mines priority business is coal and energy production. Carbon speculation and mechanisms are usually beyond their normal focus of investment. We should realise that no initial investment will take place in a large CAPEX project with uncertainty over the period of return.

In this situation, we recommend that where a robust and additional project is approved by the Register, it retains its 10 year crediting period, irrespective of future compliance requirements.

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Without such a modification to the protocol, investment will be stunted, and methane will be continue to be emitted to atmosphere, until either another carbon trading protocol emerges, or a VAM/CMM compliance regulation emerges.

If the protocol keeps the termination of crediting period upon regulation clause as is, it will merely delay technological innovation and delay investment in methane abatement.

If we were dealing with CO2 emissions in these volumes, this could possibly be considered an acceptable penalty, but with methane, with a GWP of around 62 over 20 years, we cannot afford to procrastinate. We can either have an investment mechanism or a compliance requirement, but this clause for termination of crediting period effectively confuses the two schemes, tripping up the investment mechanism for mitigation.

This issue has already been examined in detail by the UNFCCC, and their conclusion concurs with our opinion (under the Marrakesh Accords).

Figure 4.1 Page 15

Item SSR6

For clarity, it is understood that equipment installed for the safety of the mine shall be Excluded and that equipment that is required additional to that equipment, and which is required for operation of abatement or power generation equipment shall be included. Please confirm that this is the case.

Section 5.2.2.1 Identifying Eligible SMM

It is recommended that the Protocol adopts the UNECE Glossary of Terms to enable international continuity of understanding.

Section 6 Project Monitoring

Para 3 Correction of Volumetric flow to Standardised flow

Volumetric flow instruments typically standardise externally to the instrument. While some instruments with smart multi input transmitters can internally standardise, these are not particularly common. Slight reword suggested to remove implication that internal standardisation is preferred,

Para 5 Exhaust Gas Monitoring

We refer to the requirement that exhaust gas fraction of methane is measured continuously and recorded every two minutes.

Though this requirement is technically achievable, from an engineering view it is not very practicable, and would add significant excessive cost for little practical benefit.

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With VAM abatement technologies, it would be usual to have a number of oxidiser units on a single mine evasé. In this situation a single methane concentration monitoring unit would be installed in the feed duct (which would be a common feed duct to all of the oxidisers in the shaft group). This would monitor continuously and would be easily capable of recording data points every 2 minutes. This is in accordance with the requirements of the protocol.

From an engineering perspective, the usual solution for measuring exhaust gas methane concentration would be to install a single methane concentration monitoring unit and to have this single unit switch between sample gas flows at the outlet of each unit in the shaft group.
The exhaust gas would be piped from exhaust vent of each unit separately and pumped to the monitoring point. The gas sample would be cooled, filtered and de-watered then fed into the transducer. In between each unit's exhaust gas being sampled, the sensor would have a purge cycle.

Unfortunately exhaust gas methane is more difficult and expensive to measure than inlet air methane, as the sample must be more carefully cooled and conditioned prior to entry into the methane transducer.

The significant cost of multiple exhaust methane monitoring units on a single project would add a very major cost element to any project, pushing out payback period and therefore reducing the likelihood of a project going ahead.

As VAM concentrations of methane and airflows are generally extremely stable, the oxidisation process is as stable as the airflow entering the unit, and the purpose of exhaust methane monitoring is to verify the destruction efficiency of each unit, it is clear that continuous monitoring is unnecessary, and that a regular check is more than adequate.

If we assume a maximum number of units at a particular mine at say ten units, and with a sample period for a particular exhaust gas stream of two minutes (including purge), we would recommend that the protocol is amended such that continuous monitoring is not required, but that the exhaust gas is sampled and recorded at intervals of no more than 20 minutes.

We would request that the balance of cost and benefit are considered to ensure a practicable solution is allowed.

Section 6 Project Monitoring

We consider the protocol's requirements in respect of methane concentration monitoring to be appropriate and practicable.

We consider that the combination of transducer accuracies required for mass flow (being a combination of volumetric, methane concentration, pressure and temperature) render the proposed checking, calibration and failed calibration guidelines *impracticable* with current instrumentation technology. We must differentiate between volumetric flow, standardised flow and mass flow and then understand how the instruments would be calibrated.

We recommend that field checking and calibration requirements are limited to volumetric flow rather than to mass flow as per the protocol.

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Field checking of flow meters for calibration accuracy for *mass* flow is actually very difficult, especially when used to determine whether a unit requires calibration. While it may sound like a practical technique, we see difficulties in actual execution of this practice.

Flow measurement for CMM and VAM is relatively inaccurate, as the fluid gas being measured is variable in analysis, density, humidity and dirt loading. For these reasons, robust measurement techniques must be used which balance operational reliability and accuracy.

Integral mass flow instruments are uncommon, and in any case they are specifically excluded by the protocol, as the protocol requires separate measurement of the methane concentration to calculate mass flow. It will be *impossible* to calibrate a flow meter on mass flow, as the mass flow calculation requires the input of the methane concentration unit, which cannot be part of the calibration process.

Calibration of volumetric flow instrumentation requires removal of the flow instrument and taking it to a certified wind tunnel at a lab for checking.

Field checking is where the original installed instrument is checked by using another similar or different type of flow meter, either physically at the same point as the original instrument, or at a different point in the pipe/duct system.

The problem is that the *checking device* being used to check the original installed instrument is likely to have similar accuracy as the original installed instrument, and it is likely that the two instruments will never read within 5% of each other. This would result in quarterly calibration of the volumetric flow transducer, which while practicable for many instruments, is simply impractical for flow. We could be in a situation where even immediately after calibration the checking device doesn't get within +/-5% of the original instrument, its just a function of the practical accuracy of measuring gaseous fluid of this nature.

I recommend that this section is re-written to reflect the levels of accuracy that current technology allows us to achieve in practice, and that volumetric flow is the parameter which must achieve the stipulated accuracy of +/-5% rather than the overall system to deliver mass flow. We must differentiate between volumetric flow, standardised flow and calculated mass flow.

Table B.2 Default Destruction Efficiencies for Combustion Devices

A high speed lean burn reciprocating gas engine should have slippage of no less than 97.5% and a destruction efficiency of 99.5%. This would give a theoretical minimum of 97.01% overall destruction efficiency, however practically, this un-burnt slippage would be oxidised in the exhaust pre-turbo.

Larger, slower speed gas engines (which require higher inlet fuel gas pressures and are therefore unsuitable for CMM) could historically have had worse slippage, but would be impracticable and non viable now as the reduction in efficiency would be considerable.

We recommend that the default destruction efficiency for lean burn gas engines is defined at the practical and actual level of 99.5% or at the very least the theoretical level of 97.01%.