SUBMISSION TO PIU RESOURCE PRODUCTIVITY AND RENEWABLE ENERGY PROJECT

Prepared by The Association of Coal Mine Methane Operators

Executive Summary

Coal Mine Methane (CMM) is a waste product of the deep coal mining industry which leaks into the atmosphere from abandoned mines adding to global warming. This powerful greenhouse gas can be captured and used to generate electricity and in so doing:

- Its global warming potential is greatly reduced
- it substitutes for conventional fossil fuels.
- It stimulates a new UK developed technology export industry
- It brings private inward investment into deprived coalfield communities
- It creates skilled and unskilled jobs in regeneration areas

In this document the scope for development of the technology required to capture CMM for use as a fuel is outlined along with details of the barriers preventing the expansion of the industry.

Finally, the industry itself is explored, especially the market led nature of the technology, and the potential for greater growth and the creation of export markets.

1.0 Introduction to ACMMO

The Association of Coal Mine Methane Operators (ACMMO) represents 13 companies involved with the extraction and use of methane from disused coal mines to generate electricity. The Association has just been formed to represent what is a very young industry, but one with the potential of:

- making a significant contribution to the country's energy needs
- substantially reducing greenhouse gas emissions.

2.0 Coal Mine Methane (CMM)

In a typical UK coal mine up to 80% of the coal may be left behind when the mine is closed. The mining process causes the remaining seams to fracture and de-stress allowing the methane trapped in the coal to escape. This is either vented to atmosphere in a controlled way or escapes haphazardly to the surface. CMM reserves could continue to vent to atmosphere for over 50 years compared with an average life of 20 years for landfill methane.

There are more than 900 closed deep coal mines in the UK from which it is estimated that a minimum of 300,000 tonnes of CMM, equivalent to 6.3 million tonnes of carbon dioxide, are seeping into the atmosphere every year.

CMM has a Global Warming Potential 21 times greater than that of carbon dioxide. At the current rate of escape into the atmosphere CMM is making a significant contribution to the UK's greenhouse gas emissions.

By capturing CMM and converting it into useful energy, the global warming potential is reduced by 87%.

The five projects now operated by ACMMO members already benefit the environment by capturing emissions equivalent to the removal of around 160,000 cars from the roads (based on US EPA data).

3.0 Our Perspective on the Project

We welcome the instigation of the inquiry and the wide ranging remit, especially the recognition that Governments can assist in integrating economic growth with environmental and social goals to achieve rising prosperity and higher rates of sustainable growth.

CMM technology is that of using a waste product from another industry in a new process with the result that it can substitute traditional non-renewable forms of energy. Whilst accepting that the inquiry has a very broad remit, we would suggest that energy technologies which use existing waste has been overlooked.

We also recognise the desirability of a long term view. However, the Government will struggle to meet the targets it has set itself of reducing the UK's emissions of greenhouse gases by 23% by 2008-2012 and of having 10% of electricity generation from renewable sources by 2010. The reality is that most renewable technologies are not developed to deliver sufficient generating capacity to meet these targets and many are years away from this point.

4.0 The Potential for Coal Mine Methane as an Energy Source

CMM is a sustainable source of energy derived from bacterial breakdown of organic materials. Its presence has been known since the beginning of the underground mining industry (hence the development of the traditional miner's lamp to aid detection of the gas). CMM was used at several working coal mines by British Coal as fuel for pithead water boilers and small scale power generation. It is only within the past 3 years that the technology has been developed to exploit it as a commercially viable energy source.

Since 1999, CMM has been captured and used for power generation and industrial fuel on a commercial basis in the UK. The five plants currently operating, supply methane sufficient for around 30MW of distributed generation which is supplied competitively to local industrial users.

At Shirebrook, the CMM plant already produces enough power (9MW) to supply 10,000 homes. By the end of this year, a further 10 plants could be in operation bringing the total combined energy output to about 120MW.

Creating greater demand for CMM, through giving limited Government support, should enable the fledgling industry to extend its reach to smaller mines which are not commercially viable but which in total emit large quantities of greenhouse gas.

Currently only the larger sites in the region of 6 to 9MW capacity are feasible for commercial development. This is because there are substantial costs involved in developing a site to access the gas and in constructing an extraction plant. The connection of the power generation plant to the local electricity grid is also a significant cost factor. These costs need to be spread over as large an output of electricity as possible. Moreover, with low electricity prices prevailing in the market, and the risks attached to this type of new gas supply, the price that the CMM operator can obtain for the gas, as generator fuel, is very much below market prices for Transco gas.

A small number of sites with potential for a large output are available and these are likely to be developed by ACMMO's members. However, the majority of the 900 potential sites are much smaller and will not be economically viable.

The stimulus of increasing the realisable price for electricity generated from CMM, through inclusion in the Renewable Obligation, will enable the economic threshold to fall to 2 MW or even lower. This would allow a substantial proportion of these greenhouse gas emissions to be captured. The emerging CMM industry would then receive a significant increase in its profile, drawing in the investment needed to speed up the development of projects.

As ACMMO member companies' research and development is extended to the majority of the 900 abandoned deep coalmines in the UK, it is possible that as many as 30 currently uneconomic projects a year could be additionally completed. Thus, installed CMM generating capacity could, by 2005, approach 800 MW, matching the total capacity of live renewable projects at 31st March 2000, excluding large-scale hydro (ETSU Comm.)

By 2010, with some incentives, there could be an additional 300 projects in operation with a capacity exceeding 1GW. The UK's reserves of this gas should be sufficient to last for at least 25 years.

5.0 How Government Policy Can Support Coal Mine Methane

The 5 projects now operated by ACMMO members have already achieved a production capacity of 30MW of distributed electricity in less than 18 months, and the potential is huge with some 900 disused deep coal mines throughout the country. Obviously, companies in the industry will start by developing the largest reserves, sufficient to produce in excess of 9MW, but, with the RO incentive in place, hundreds of smaller methane emission sites could be tapped.

In Germany, where a 5p/kWh incentive was given to mine gas in the Renewable Sources Act 2000, it is reported that more than 80 planning applications have already been made for CMM to power plants on abandoned mine sites. In the UK, the 3p/kWh incentive given to landfill and sewage gas under the renewable obligation is currently unavailable to CMM, a gaseous by-product of coal mining, unless it can be included as a "waste" in the regulations being implemented under the Utilities Act. The reasons for the exclusion of this UK developed greenhouse gas mitigation technology seems to be that CMM had not been recognised as a major atmospheric pollutant at the time the Act was being drafted.

CMM has yet to be classified as a renewable source and be included in the renewables obligation despite the fact that it is a clearly a waste product of coal mining currently venting to atmosphere. The process of formation for landfill gas and CMM is similar - the bacterial decay of organic matter, but CMM has a methane content of around 70% compared with 45% for landfill gas.

Another anomaly is that, whilst CMM supplied directly to end users as burner tip fuel is exempt from the climate change levy, where it is supplied as fuel for distributed power generation, it is not exempt. Paragraph 3(2)(b) of Schedule 6 to the Finance Bill classifies Coal Mine Methane as a waste within the meaning of Part II of the Environmental Protection Act 1990. We see the direct use exemption as a clear recognition of the environmental benefit of CMM capture. However, it is anomalous that power generated from the same fuel source is not. This is at odds with your aim stated on March 6 to "lead the thinking in Europe on how to remove the regulatory barriers to the development of renewables".

Without some form of incentive such as the 3p per kWh under the Renewables Obligation, only the most commercially viable sites will be developed and a huge amount of CMM will continue to escape to atmosphere. CMM is closer to large scale development than most renewable energy technologies and the stimulus of increasing the realisable price for electricity generated from

CMM will enable smaller schemes in the UK to become viable. It would also go a long way to meeting the shortfall in renewable generation and provide a rapid reduction in greenhouse gas emissions long before other technologies, which are still in a development phase, have a beneficial impact on global warming. The German example shows how the RO incentive, which costs the Government nothing, can stimulate the development of CMM.

6.0 Coal Mine Methane - a Market Led Green Energy Technology

This exciting and innovative industry is not being developed by large corporations or the utility companies, but by innovative British SMEs backed by venture capital. The green energy technology we have created is commercially proving itself, without the government support given to many renewables, as an energy source and method of reducing greenhouse gas emissions. Significant installation of CMM capture technology in the UK would assist the Government, to tackle climate change and meet the objective pledged by the Prime Minister to nearly double the Kyoto target and cut the UK's emissions of greenhouse gases by 23% by 2008-2012.

Encouraging and supporting the growth and development of the industry would provide the significant boost the home market needs for these companies to credibly approach the regulatory authorities and power generators overseas. Through limited support from the Government the industry could develop into a world leader in exploiting CMM.

There is a great deal of potential in energy poor countries which are closing mines as natural gas replaces coal as the fuel of choice. Interest in the technology has already been shown from many export markets including Russia, Ukraine, India, Australia, South Africa, China and the USA. Not only will exploiting these markets lead to the creation of jobs in Britain, it will also aid global efforts to cut the emissions of greenhouse gases.

The development of pithead CMM plants contributes to the economic regeneration of deprived coalfield communities. Projects launched so far have already provided more than £14 million of inward investment to help kick start local economies in the East and West Midlands and Yorkshire.

All of these spin offs demonstrate that Coal Mine Methane technology can meet objectives broader than providing energy and reducing greenhouse gases, and can play a part in developing sustainable communities and creating jobs and economic growth for Britain.

7.0 Conclusions

- Coal Mine Methane (CMM) is a hazardous waste gas that escapes into the atmosphere from abandoned coal mines.

- CMM should be included in the Renewables Obligation as it is Germany along with landfill methane and sewage gas.

- CMM is a major contributor to the UK’s greenhouse gas emissions, and its capture to generate electricity will significantly reduce the level of these emissions in a cost effective way within a relatively short lead time.

- CMM is a clean source of indigenous energy that is already commercially proving itself and, with limited Government stimulus, could contribute an additional 1GW to the country’s electricity requirements by 2010.

- Coalfield-wide power generation from CMM would provide a powerful advance towards the targets the Government has set itself of reducing the UK's emissions of greenhouse

gases by 23% by 2008-2012 and of having 10% of electricity generation from renewable sources by 2010.

- In recognition of the significant reduction in greenhouse gas emissions that would result, as well as assisting the Government to meet its renewables target, CMM should be given limited Government support.

- Coalfield community regeneration is a Government priority; CMM helps to drive this policy forward by bringing private inward investment into deprived coalfield communities.

- Worldwide interest in ACMMO members' technology has been immense but, to develop the potential export market, the industry needs to establish fully a solid base in this country.

8.0 Further Contribution

We would be very pleased to meet PIU team members to discuss further the issues raised in this document. We could arrange to show you at first hand an example of the technology involved in converting CMM to electricity. The sites currently operating are Hickleton, between Barnsley and Doncaster, Shirebrook in Derbyshire, Steetley in North Nottinghamshire and Silverdale near Newcastle under Lyme.

- The discussion could cover more detail about:

- Our experience of developing this green technology

- How initial barriers were overcome

- The barriers to further development and how they may be tackled

- Experience overseas

- How ACMMO members have succeeded in attracting private capital to develop the industry

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