



COALBED METHANE EXTRA

A publication of the Coalbed Methane Outreach Program (CMOP)

<http://www.epa.gov/coalbed>



International CBM/CMM Development

Interest and investment in international coalbed methane (CBM) and coal mine methane (CMM) project development is expanding. This and the next issue of the Coalbed Methane Extra will focus on international organizations promoting such development, current projects, and emerging project opportunities. In this issue, we outline the activities and highlight some recent accomplishments of three important CBM and CMM development organizations abroad: China Coalbed Methane Clearinghouse, Russian Coalbed Methane Center, and Ukrainian Alternative Fuels Center.

{Note: Additional information on these three CBM development organizations can be found in the "International" pages of the CMOP Web site - <http://www.epa.gov/coalbed>.}

CBM Development Initiatives at the China Coalbed Methane Clearinghouse

The China Coalbed Methane Clearinghouse, located in Beijing, was established in August 1994 to promote coalbed methane (CBM) recovery and use in China. Part of the State Administration of Coal Industry's China Coal Information Institute, the Clearinghouse provides direct assistance to those interested in developing China's CBM resources.

China has one of the fastest growing economies in the world, and it is experiencing rapid growth in the demand for energy. China also has a vast CBM resource, and China's coal mine methane (CMM) emissions are the highest in the world. Because CBM/CMM is a source of useable natural gas, there is excellent potential for CBM/CMM recovery and use.

The Clearinghouse supports CMM development by providing information, facilitating contact with gov-

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Russian Coalbed Methane Center Promotes CBM/CMM Development in Kuzbass

The Russian Coalbed Methane Center was established in 1995 to promote coalbed methane (CBM) and coal mine methane (CMM) recovery in Russia. Its primary roles are to help identify and evaluate potential CBM/CMM projects and to provide technical and other assistance to foreign and domestic private businesses and government agencies interested in developing Russian CBM/CMM. The Center is strategically located in Kemerovo in the heart of the Kuznetsk Coal Basin (Kuzbass), which is Russia's largest coal producing region.

Large untapped reserves of CBM remain in Russia, where coal mines release more than two billion cubic meters (more than 70 billion cubic feet) of CMM to the atmosphere annually. CBM/CMM drainage projects offer attractive business

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Ukraine's Alternative Fuels Center Pursues Expanded CBM/CMM Development Target

In 1998, Ukraine's National Academy of Sciences and the Ministry of Coal launched the Alternative Fuels Resource Center (AFC) in Kiev. Ukraine has set a coalbed methane (CBM) and coal mine methane (CMM) production target of 8 billion cubic meters (283 billion cubic feet) annual production by 2010. In pursuing that target, the AFC strives to improve informational, organizational, promotional, and investment-related avenues to assist in developing a modern CBM/CMM technology in Ukraine.

CBM resource assessment has been underway for over a decade in Ukraine, initially undertaken in conjunction with planning coal mine ventilation and degasification systems necessary for mining safety. Today the country also recognizes CBM's value as a source of natural gas.

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China

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ernment officials, and supplying logistical and consulting assistance to private businesses and foreign and domestic government agencies interested in CBM/CMM recovery and use in China. Furthermore, it assists in assessing the feasibility of CBM/CMM development projects.

Following are selected Clearinghouse activities:

Business Advisory Committee –

The Clearinghouse participates in a newly formed Business Advisory Committee (BAC) that promotes economically and environmentally sound CMM development in China. Members of the committee include energy exploration and development firms, energy equipment manufacturers and vendors, companies interested in reducing greenhouse gas emissions, Chinese coal companies, and China United Coalbed Methane Corp., Ltd.

The BAC helps Chinese coal mining companies develop their CMM resources by facilitating the information transfer necessary to attract and engage CMM development project investors. It will attract investors by developing detailed mine-specific CMM project profiles. This includes: (1) identifying the types of information that coal companies should make available to potential project investors; (2) helping coal companies to most effectively demonstrate their CMM development prospects to potential investors; and (3) describing for potential investors the

technical, financial, and institutional factors that make such projects attractive investment opportunities.

Asian Development Bank Project at Yangquan Coal Group –

The Clearinghouse assisted in a feasibility assessment, supported by the Asian Development Bank (ADB), for a CBM-fired power plant at the Yangquan #5 coal mine in Shanxi Province. Investigators expanded the assessment to include the #1, #2, #3, and #4 mines, and concluded that there is enough CBM available from all five mines to fuel up to 25 MW of power production.

Based on the assessment, the ADB is planning to lend funds to the Yangquan Coal Mine Group for construction of a new 10 to 15 MW CBM-fired demonstration power plant. The plant will use imported equipment, and the Clearinghouse and ADB are seeking foreign companies that can invest and participate in the project.

In April 1999, the Clearinghouse initiated a prefeasibility assessment for another ADB project component to be located in the new Hanzhuang coal field. This would involve CBM drainage and would use the drained gas to produce electric power and to supply domestic cooking fuel in Taiyuan, the capital of Shanxi Province.

Chinese CBM Development Project Economic Model –

The Clearinghouse completed an economic analysis model for assessing CBM/CMM projects (documented in Chinese and

English). The model allows evaluation of three methane recovery options and nine use options.

Publications – Each year since 1995 the Clearinghouse has published two issues of its magazine, *China Coalbed Methane*, providing technical papers as well as other CBM/CMM-related information.

Recently the Clearinghouse has developed important technical documents for CBM/CMM project developers in China. These include *Reducing Methane Emissions from Coal Mines in China: The Potential for Coalbed Methane Development*, jointly developed with the U.S. Environmental Protection Agency, and *A Study of the Legal Framework and Policy Options for Coalbed Methane Development in China*.

Summary Report: Clearinghouse Accomplishments and Future Plans –

The Clearinghouse is preparing a report documenting its accomplishments and activities to date and identifying plans for the future. On December 1, 1999, a workshop was held in Beijing to formally present the report's contents and to discuss future activities. For example, in addition to site-specific project assessments, the Clearinghouse will identify interested industry contacts and develop relationships with companies that can invest in CBM/CMM projects in China. Other activities include data development relating to coal mines, CBM/CMM resources, and CBM/CMM markets. These efforts will

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China

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identify potential areas for CBM/CMM use and establish an active network of coal mines, investors, and users.

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Russia

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opportunities for project developers and investors.

The Center evaluates potential economic impacts and benefits of CBM/CMM development in Russia and recommends government policies to promote CBM/CMM recovery. It analyzes mine-specific information to identify viable CBM/CMM development sites, works to introduce new methane recovery and use technologies to Russia, and disseminates information to energy companies and other interested organizations. It also acts as an intermediary to introduce mine and gas industry contacts to potential business partners.

Following are recent and current activities of the Russian CBM Center.

Methane Mitigation Conferences –

The Center is involved in planning and coordinating the Second International Methane Mitigation Conference, to be held in June of 2000 (see conference notice and description on page 5). In addition, the Center has participated in a number of other conferences addressing topics of importance to CBM/CMM developers, such as the Intergovernmental Panel on Climate Change/United Nations Environment Programme/World Health Organization's May 1999 conference ("Good Practice in Inventory Preparation: Energy, Transportation, and Fugitive Emissions") held in Prague, Czech Republic. At that event, the Center's Director participated in a working group on best practices for estimating CBM emissions from coal mines.

Coal Properties Analysis –

Kemerovo is the site of a new analytical laboratory that will investigate Kuzbass coal seam permeability and desorption proper-

ties. The Center is helping to secure state-of-the-art analytical equipment and coordinate its transportation to Kemerovo. Sample collection is scheduled to begin by January 2000.

Kuzbass CBM Program Feasibility Assessment –

The Center will be the Russian lead in assessing the feasibility of a CBM drainage and utilization program in the Kuzbass. The feasibility assessment, funded by the Russian government and the United Nations Development Programme, will result in a project brief focusing on CBM projects at selected mines. The Center will seek funding for project implementation at those mines from the Global Environment Facility. Work on the feasibility assessment has just begun. Contractual arrangements are now underway, and a project kickoff tentatively is scheduled for January 2000.

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What's Available on the CMOP Web Site?

Please visit our web site at <http://www.epa.gov/coalbed> to:

- Learn about the Coalbed Methane Outreach Program's mission and activities,
- Obtain timely notice of upcoming coal mine methane (CMM) events,
- Gain an introduction to CMM development activities in the U.S. and abroad,

- Download technical reports, and
- Access contact information for CMM experts and CMOP staff.

CMOP welcomes your comments on the utility of the site and its content. Also, if your firm should be included in the Companies/Experts pages, use the registration form provided on the Web site. Simply fill out the form and submit it to CMOP via mail, e-mail, or fax.



Ukraine

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In Ukraine, CBM reserves lie not only in coal seams but also in the surrounding rock strata. In fact, the presence of CBM in interbedded rock strata in the Donetsk coal basin (Donbas) is geologically unique and contributes substantially to overall resource availability.

Ukraine's ability to apply creative solutions to energy supply problems was well demonstrated in the summer of 1999 when gasoline prices rose sharply as supplies dwindled. To keep vehicle fleets operating in the Donetsk Basin, engineers applied past experience gained at a number of coal mines and farms where compressed CBM had been used successfully as an alternative vehicle fuel. Hundreds of vehicle engines were modified to run on compressed CBM. Not only is it less expensive than gasoline, but operators report better engine life with CBM fuel. This experience points to a possible long-term industry in the coal region and offers one example of the type of innovative CBM and CMM development initiatives that the AFC may be able to promote in the future.

The following are highlights of recent and current AFC CBM/CMM development initiatives.

The AFC Advisory Board – The AFC Advisory Board, which includes members from 11 Ukrainian

government agencies, provides direction and support for the AFC and advice on government policies that could stimulate expanded CBM development in Ukraine. The Board is the first integrated governmental organization established in Ukraine specifically to provide in-depth focus on CBM/CMM development-related issues. It constitutes a particularly important resource for foreign investors because it can clarify existing government policies, regulations, and organizations affecting CBM/CMM development.

CBM Drilling Pilot Program – The AFC has responsibility for planning and coordinating a pilot program to demonstrate the feasibility of drilling CBM drainage wells in advance of mining. The project, which will involve 29 test wells in five areas of differing geologic conditions, began with drilling one exploratory and one production well in the Chervonoarmiysk area where there are two additional production wells planned. Not only is the project intended to provide data on technical feasibility of such methane drainage techniques, but it also may generate information useful to the government in creating incentives for future CBM/CMM development.

CBM Production Pilot Program – The AFC is participating in a project supported by the World Bank and the Global Environment Facility to demonstrate CBM production potential. The project includes six wells initially, and will add two wells

each year to maintain gas flows over time in a 74,000-acre area. Estimates of CBM resources in the studied area range from 925 to 3,700 billion cubic feet.

Handbook on Gassy Mines – The AFC's Environmental Group is developing an inventory of gassy mines that offer the potential for CBM/CMM development projects, based on emissions data from the ventilation and degasification systems of all active mines in Ukraine over the past five years. The inventory includes geological, production, and engineering data; current mining techniques; mine-specific and local area energy supplies and needs; mine legal status; and CBM/CMM marketing analyses.

CBM Resource Determination Conference – In May 1998, the AFC hosted a three-day conference on quantifying Ukraine's available CBM resources. Technical topics of concern included methods for measuring gas content, determining resources, and estimating reserves. One product of the conference was a comparison of the methods that have been used in the U.S. and Ukraine and their application to conditions in Ukrainian coal fields.

Update Your Web Site Link

The Coalbed Methane Outreach Program (CMOP) recently upgraded its Web site. If you previously installed a link in your Web site that takes users to the CMOP site, please check that it points to the current CMOP address (<http://www.epa.gov/coalbed>).

Contact the Ukraine Alternative Fuels Center

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U.S. and Russia Sponsor International Methane Conference

The Second International Methane Mitigation Conference will highlight cost-effective methane mitigation options. This conference will address all significant methane emission source categories, offering industry representatives, scientists, policymakers, project financiers, and regulators a unique opportunity to consider this climate change issue in a comprehensive manner.

The Russian Academy of Sciences and the U.S. Environmental Protection Agency will cosponsor the conference, to be hosted by the Russians at Akademgorodok (Science City) near Novosibirsk in June of 2000. The following topics will be addressed.

Plenary Session – This session will introduce climate change policy, atmospheric effects of methane release, alternative methane emission mitigation options, and the economic and environmental implications of various mitigation policies.

Technical Sessions – Concurrent sessions will address the policy, technical, and economic implications of existing and emerging methane emission mitigation options applicable to coal mining, natural gas systems, ruminant livestock, and solid waste disposal.

Field Trips – To provide concrete examples of the methane mitigation alternatives discussed in the technical sessions, field trips will offer

Upcoming Events

Coalbed and Coal Mine Methane - A New Energy Resource for the 21st Century

Denver, Colorado
March 27 & 28, 2000

This conference, presented by Strategic Research Institute, will bring together industry and government representatives to discuss crucial questions of coalbed and coal mine methane development and use. Topics to be addressed are reservoir assessments, news in completion technology, environmental considerations, regulation issues, and economic advantages of CBM/CMM production. The conference will present several case studies of projects in the U.S. and abroad, and also offer first-hand insights in sound project development for coalbed and coal mine methane. The Chairman of the conference is Raymond Pilcher, President of Raven Ridge Resources, Inc. The

participants an opportunity to view first hand the technical challenges and opportunities associated with practical methane emission reductions.

Although participants are responsible for their own transportation and lodging, the conference itself is free of charge. Conference organizers recently issued an initial call for papers requesting abstracts (<400 words) addressing methane-related atmospheric science, policy, and mitigation options, and early response is active.

senior panel of speakers will include Barrett Resources, USA; BCK Engineering, USA; CSIRO, Australia; U.S. Environmental Protection Agency; U.S. Geological Survey; and Western Gas Resources Corp., USA. For further information or to request a brochure, please contact Ms. Katrin Sell, Strategic Research Institute, by mail at 333 7th Avenue, 9th Floor, New York, NY 10001-5004; by phone at +1-212-967-0095, ext. 271; by fax at +1-212-967-7973 or 7974; or by email at ksell@srinstitute.com.

Second International Methane Mitigation Conference

Akademgorodok (Science City)
Novosibirsk, Russia
June 18 - 23, 2000

See conference article on this page.

To obtain the call for papers, preliminary agenda, and registration form, visit the "What's New" page of the CMOP World Wide Web site (at <http://www.epa.gov/coalbed>) and click on the link in the conference announcement under "Upcoming Coalbed Methane Events." Alternatively, contact Karl Schultz of the U.S. Environmental Protection Agency's Coalbed Methane Outreach Program in Washington, DC by phone at (202) 564-9468 or by e-mail at schultz.karl@epa.gov.



U.S. and Canada Active in Greenhouse Gas Credit Trades

A U.S. landfill company, Zahren Alternative Power Corporation (ZAPCO), sold 2.5 million metric tons of CO₂ emission credits to Ontario Power Generation, Inc. (OPG - formerly Ontario Hydro). ZAPCO, one of the largest landfill gas-to-energy project owner-operators in the U.S., collects and combusts landfill gas (containing methane that otherwise would be vented to the atmosphere) to make electricity. The 119,000 metric tons of methane involved in this trade come from over 20 ZAPCO sites in 1998, 1999, and 2000. OPG is North America's fifth largest electricity generator, supplying

power to customers in Ontario and Michigan.

In another recent U.S.-Canada deal, a group of Canadian power companies (the Greenhouse Emissions Management Consortium) agreed to purchase GHG emissions reduction credits from IGF Insurance, a U.S. crop insurer. Iowa farmers (IGF policyholders) will generate the credits through a variety of agricultural practices that reduce greenhouse gas emissions. Initially the consortium will buy credits for 500,000 metric tons of carbon equivalent, with the option to increase the purchase to a total of 2.8 million metric tons or more.

Recent Mining Trends Reveal Continued Methane Emissions Reductions

The U.S. Environmental Protection Agency's most recent data show a continued decline in methane emissions from the U.S. coal mining industry¹. Total coal industry methane emissions, which were 218.4 billion cubic feet (bcf) or 24.0 million metric tons of carbon equivalent (MMTCE) in 1990, were down to 171.6 bcf (18.8 MMTCE) in 1997 – a 22 percent decrease. The 171.6 bcf released in 1997 comprised 10 percent of anthropogenic (man-made) methane releases to the atmosphere in the U.S. that year.

The 1997 coal industry methane emission reductions resulted primarily from increased methane recovery and use at underground mines. This continues the trend previously reported in the Septem-

ber 1998 issue of the *Coalbed Methane Extra*². Overall, methane recovery and use was 15.6 bcf (1.6 MMTCE) in 1990, rising to 41.6 bcf (4.6 MMTCE) in 1997. Emissions from surface mines and post-mining were stable over this period. U.S. coal production varied from a low of 858 million metric tons in 1993 to a high of 989 million metric tons in 1997.

¹ USEPA 1999 – *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 1997*, U.S. Environmental Protection Agency, Office of Policy, Planning, and Evaluation, EPA 236-R-99-003, April 1999, available for downloading from the Web at <http://www.epa.gov/ghginfo/new.htm>.

² Back copies of the *Coalbed Methane Extra* can be viewed and downloaded from the CMOP Web site at <http://www.epa.gov/coalbed>.

Russia

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CBM Recovery and Use Project Support – The Center interacts directly with coal mines, mine associations, and the Kuzbass regional administration to promote CBM recovery and use projects.

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