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CHEMONICS INTERNATIONAL INC.

Alternative Fuels Center (AFC) Evaluation

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**Submitted by:
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EXECUTIVE SUMMARY

Background

The Alternative Fuels Center (AFC), a for profit state joint venture, was created by the Ministry of Coal Industry (MCI) of Ukraine and the National Academy of Sciences (NAS) of Ukraine. The AFC is chartered to address a full range of activities from scientific research to commercial project development and implementation and the full range of hydrocarbon-based “alternative fuels.”

The United States Agency for International Development (USAID) supports the AFC by providing funding for a variety of purposes. At the core of this USAID initiative is the Technical Support Group. In general, the Group is charged to work on many technical and informational projects that can assist in the growth of a coalbed methane (CBM) industry in Ukraine.

Despite many accomplishments by the AFC and a government-stated goal of producing 8 billion cubic meters of CBM per year by 2010, there has been very little commercial interest in CBM development in Ukraine. As a result, USAID has requested this evaluation to ensure that its funding is put to best use.

Current Environment for CBM Development in Ukraine

The key issues that are currently facing development of the CBM industry in Ukraine include:

- The Ukrainian economy is severely depressed hurting its investment climate. In addition, there are significant technical, economic and political risks facing CBM project developers in Ukraine. However, the new Ukrainian government has initiated very positive actions to address the major problems that have caused Ukraine’s economic and energy problems.
- Ukraine imports huge quantities of natural gas from Russia at a highly discounted price, which causes many problems.
- The coalbed methane resources of Ukraine are very large. Its production, and use, have significant economic, political, safety and environmental benefits.
- Strong technical expertise exists in Ukraine to characterize its CBM resources and to produce gas from coal mines and sandstone.
- Very little expertise or technology exists to drill and produce CBM from vertical wells, the primary method that needs to be used to produce the majority of Ukraine’s CBM.

Findings/Conclusions

The principle findings of the evaluation are:

- There is anticipation of significant reform in the government.
- There is significant knowledge and interest about CBM within the government.
- There is high probability that the CBM resource is of sufficient size to sustain large-scale development.
- Indigenous Ukrainian technical capability and equipment is antiquated.
- There is a ready market for produced CBM in Ukraine.
- The AFC, as now organized and operated, presents a conflict of interest.
- The Technical Support Group of the AFC is providing significant value.
- The pilot demonstration projects being undertaken in Ukraine and managed by the AFC will not provide value to the formation of a viable CBM industry in the short term.
- The AFC is not focused and has conflicting priorities.
- The AFC costs can be reduced while still meeting USAID's objectives.

It was concluded that:

- The only realistic sources for near-term financial support to the AFC are from USAID and USEPA. Other funding sources (summarized in Section III) are possible but they would require time and significant effort to secure. A funding commitment of three or more years will be necessary to achieve significant results.
- The "for profit," project development part of the AFC needs to be separated from the Technical Support Group.
- The Technical Support Group has provided value that will support the creation of a CBM industry in Ukraine. Future funding would allow it to continue its efforts, which are especially important now as the new Ukrainian government undertakes reform.
- If cost-reduction of USAID's support to the AFC is important, options to reduce costs are possible. Partners in Economic Reform (PIER) could be replaced by an organization with a limited scope of work. PIER's Kiev office could be closed. Other options are also available.
- The Technical Support Group should be kept intact, as much as possible. It should focus on the important tasks of legislative and regulatory initiatives, compiling and publishing information about CBM, and training pertinent Ukrainian personnel. In implementing changes to its assistance to the AFC, USAID should avoid creating a gap in continued funding for the Technical Support Group.

Recommendations

As a result of the information gathered during the many interviews conducted for this evaluation, the following recommendations are offered.

- USAID should reassess its financial support to the “for-profit,” project development side of the AFC; it should provide funds only to the Technical Support Group.
- As a cost-cutting measure, if necessary, PIER should be replaced as the agent for the AFC. The organization that replaces PIER should have a limited scope of work. However, care should be taken to avoid a gap in funding for the Technical Support Group. A gap could result in loss of key staff and loss in momentum created by the Advisory Board.
- Focus the scope of work of the USAID-funded Technical Support Group and co-locate it with the USEPA-funded support team.
- Provide a minimum 3-year funding commitment to the USAID-funded Technical Support Group; and make funding contingent upon progress by the Ukrainian government in achieving reforms.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
ACRONYMS	iii
SECTION I – INTRODUCTION.....	1
<i>A. Background</i>	1
<i>B. Objectives</i>	1
<i>C. Solutions</i>	2
<i>D. Results</i>	2
SECTION II - SITUATION IN UKRAINE AT EVALUATION TIME	3
<i>A. Government Changes and Reform</i>	3
<i>B. Energy and Natural Gas Supply</i>	4
<i>C. The Ukrainian Coalbed Methane Resource</i>	5
<i>D. Interest and Commitment to the Coalbed Methane Resource</i>	6
<i>E. Ukrainian Coalbed Methane Technical Expertise</i>	6
<i>F. The Alternative Fuels Center</i>	8
SECTION III - ANALYSIS	10
<i>A. Assessment of the Operational Activities of the AFC</i>	10
<i>B. For-Profit Activities</i>	11
<i>C. Not-for-Profit Activities</i>	13
<i>D. Assessment of Services Provided By AID</i>	22
<i>E. Future Revenue-Generating Options</i>	23
SECTION IV - FINDINGS AND CONCLUSIONS	25
<i>A. FINDINGS</i>	25
<i>B. CONCLUSIONS</i>	27
SECTION V - RECOMMENDATIONS	29
ANNEX A – SCOPE OF WORK	33
ANNEX B - PERSONS INTERVIEWED.....	38
ANNEX C - WORK PLAN	40
ANNEX D - ACCOMPLISHMENTS OF THE AFC.....	44
ANNEX E - ADVISORY BOARD PARTICIPANTS	51
ANNEX F - BY-LAWS OF THE ADVISORY BOARD	53
ANNEX G - ADVISORY BOARD WORK PROCEDURES	57
ANNEX H - ADVISORY BOARD PLANNING COMMITTEES	58

ACRONYMS

AFC	Alternative Fuels Center of Ukraine
Bcf	Billion Cubic Feet
Bcm	Billion Cubic Meters
CBM	Coalbed Methane
ft	Feet
GEF	Global Environment Facility
m	Meters
MCI	Ministry of Coal Industry of Ukraine
MOU	Memorandum of Understanding
NAS	National Academy of Sciences of Ukraine
PIER	Partners in Economic Reform
Tcf	Trillion Cubic Feet
Tcm	Trillion Cubic Meters
U.S.	United States of America
USAID	U.S. Agency for International Development
USEPA	United States Environmental Protection Agency

SECTION I – Introduction

A. Background

The Alternative Fuels Center (AFC), a for profit state joint venture, was created on December 30, 1997 by a joint order issued by the Ministry of Coal Industry (MCI) of Ukraine and the National Academy of Sciences (NAS) of Ukraine¹. The AFC has a very broad charter² that covers the full range of activities from scientific research to commercial project development and implementation. Likewise, it is chartered to conduct activities for the full range of hydrocarbon-based “alternative fuels.”

The United States Agency for International Development (USAID) supports the AFC by providing funding for a variety of purposes. At the core of USAID support, funding is provided for a Technical Support Group. The Technical Support Group is a 4-person staff led by an expatriate coal bed methane (CBM) Resident Advisor. In general terms, the Technical Support Group is charged to work in the following areas: (1) research, clarify and enhance investment procedures which will promote growth of the CBM industry, (2) CBM training, (3) administration of the CBM programs of the AFC, (4) creation and maintenance of a resource library, and (5) publish an information journal on CBM in Ukraine.

Despite many accomplishments by the AFC and a government-stated goal of producing 8 billion cubic meters of CBM per year by 2010, very little commercial interest in CBM development in Ukraine has occurred. This has been primarily because the Ukrainian laws, policies and procedures have not been conducive to foreign investments. In addition, the Ukrainian economic situation creates significant investment risks. Without economic and legislative reforms, foreign capital and technology needed to develop CBM and other industries will not flow into Ukraine. As a result, USAID has requested this evaluation to ensure that its funding is put to best use.

B. Objectives

In light of USAID’s concerns that its support to the AFC might not result in its stated objectives – increased investment and technology transfer in CBM production and utilization – it initiated an independent evaluation of the AFC activities to be conducted by technical and organizational experts (see Annex A – Scope of Work). Specifically, it defined 3 tasks for the experts to undertake:

1. Identification of the current and required future operational activities at the AFC. Assessment of the activities against those stipulated in the MOU between USAID, MCI and NAS, and other relevant documents. Recommendations on the ability of the AFC, as currently organized, to meet its intended role, and the type

¹ Ministry of Coal Industry and National Academy of Sciences Joint Order #586/304, December 30, 1997.

² Undated joint document issued by National Academy of Sciences and Ministry of Coal Industry, “The Center for Alternative Fuels of the National Academy of Sciences and the Ministry of Coal Industry of Ukraine,” 1998.

and amount of resources that would be required to accomplish its objectives.

2. Evaluation of current and required future services provided by USAID to the Technical Support Group. Assessment of the services, comparing them to the MOU between USAID, MCI and NAS, and other relevant documents. Recommend calendar year 2000 activities and team composition to provide needed services and the value expected from this continuing support.
3. Identification of a strategy for gradually phasing-out USAID support to the AFC in a way that will enable it to become self-sufficient. This includes identification and assessment of future revenue-generating opportunities.

C. Solutions

To achieve the evaluation objectives, Chemonics, through its sub-contractor Taylor-DeJongh, contracted with a senior organizational expert, Jack Siegel, President, Technology and Markets Group, Energy Resources International, Inc., and a senior CBM technical expert, Kenneth Ancell, Vice President, Tipperary Corporation. They, in turn, interviewed relevant persons from the private sector, financial institutions, the U.S. and Ukrainian governments, and the AFC and conducted site visits in Ukraine to gather information used for the evaluation. Upon completion of their fact-finding and analysis, the experts briefed USAID Kiev personnel on their findings and completed their report. Sections II and III of this report respectively summarize the information that was collected relative to Ukraine's energy and economic situations regarding the AFC and provide analysis of the issues. A listing of the officials interviewed is provided in Annex B.

D. Results

In general, it was found that significant value resulted from USAID's investment in the AFC. However, questions were raised regarding potential conflicts of interest that exist in supporting the "for-profit" side of the AFC and, if cost is an issue, the value of retaining Partners in Economic Reform (PIER) as the project manager. In addition, issues were identified that relate to the value of continued USAID support to the AFC in light of continued problems with Ukraine's economy and legal and institutional frameworks that are impeding investment in CBM. Finally, possible funding sources for the AFC were identified, although most do not represent near-term options.

Section IV of this report details the findings and conclusions of the evaluators. Section V provides the recommendations for USAID's consideration regarding organizational, budgetary and other considerations associated with continued support to the AFC.

SECTION II - Situation in Ukraine at Evaluation Time

The evaluation of the AFC was conducted in the first half of February 2000. Of most importance is that the timing of the evaluation was coincident with a significant change in the Ukraine government. Presidential elections were held in the fall of 1999 and a new Prime Minister was installed in late 1999. Significant changes have been made at the Cabinet of Ministers level. The results of these changes are only beginning to be evident.

These events will have a pronounced effect on the formation of any CBM industry that may develop. The evaluators have identified two major impediments or barriers to formation of such an industry. These are (1) the inability of western investors to make viable business arrangements within the existing legal and regulatory framework of Ukraine and (2) the artificial gas market created by the presence of large volumes of Russian natural gas imported into and through Ukraine that is priced below world market levels. Both these issues are very large and very political, but some understanding of them is necessary to support the conclusions and recommendations of this report.

A. Government Changes and Reform

Several significant changes occurred just before the evaluation was conducted. Because much of the success or failure of the AFC hinges on government reform, a perspective of what is happening at the highest levels is important to this evaluation.

The new government has already begun to make changes that will improve the business climate in Ukraine. Two of the more significant changes revolve around the reorganization taking place in the government. Several energy ministries of importance to CBM – MCI, Ministry of Oil and Gas, and the Ministry of Electric Power -- have been combined into a single Ministry of Fuel and Energy. The AFC has been tied to the former Ministry of Coal (MCI) and the National Academy of Science (NAS). The MCI has lost some of its autonomy, as it is now part of the larger picture in the Ministry of Fuel and Energy, although the new Minister was formerly the Minister of MCI.

The ultimate effect of the merger of the several energy-related agencies has yet to be determined. However, many believe that a much more cohesive approach to energy policy can be achieved. This is a positive event since a CBM industry in Ukraine must transcend just the coal industry to have a place in the natural gas supply picture.

The second of these reforms is the stated objective to eliminate privileges in the taxation and regulatory agencies that are designed for special interest groups. If implemented, this would place CBM on a more equal footing with competing fuels. It may, however, run counter to efforts to offer incentives for early investment in CBM production.

Another significant development that will have an impact is the recent passage of the Law on Production Sharing Agreements. This law will have a profound effect on

projects dependent on foreign investment by providing foreign entities the guarantees that are necessary to reduce project risks to acceptable levels. The implementing regulations have not been promulgated at evaluation time, so the full effect of this law has not been determined.

The new government has also proposed other reforms. These too will improve the investment climate in Ukraine.

The evaluators met with representatives of government agencies, private industry, the World Bank and members of the Ukrainian Parliament concerning these basic changes. The consensus of opinion is that there is a much higher expectation of real reforms now than at any time since Ukraine's independence in 1991.

These initial actions by the Ukrainian Government to bring needed reform to attract capital are very positive steps for the formation of a CBM industry in Ukraine. These and other planned changes create the opportunity to ensure that CBM is given attention and fair treatment. Therefore, during the reform period, legislative and regulatory actions needed to attract investment in CBM should be pursued with vigor.

B. Energy and Natural Gas Supply

Energy supply alternatives are critical to Ukraine's economic recovery. Its indigenous supply of fossil fuels is declining significantly, forcing it to import large quantities of natural gas that, in turn, has increased the country's debt. The coal mines of the Donbass Basin, the major coal-producing region, are deep and dangerous and are generally uneconomic at world coal prices. These mines are being shut down at a rapid rate. The coals are very thin and very gassy making production costs high. The idle, unpaid coal miners are a very real social problem within Ukraine. It is in this same geographic area that the largest resource of CBM is available.

Natural gas consumption in Ukraine is about 70 Billion cubic meters (2.5 Tcf). About 18 Bcm (635 Bcf) is supplied from indigenous conventional gas fields and the rest is imported from the Russian fields in Siberia. The Russian government makes gas available to Ukraine for the right to transport even larger volumes across the country into Eastern Europe. The politics of this arrangement are enormous. It is in the best interest of Russia to keep Ukraine dependent on Siberian gas, creating what industry terms "The Russian Monopoly". This situation dictates the price of natural gas and hence will affect the price of CBM if it has to compete head-to-head with the Russian gas.

The price at which Russian gas is sold to Ukraine is another factor that will affect the pace at which a CBM industry will develop. The current price of Russian gas is \$83/Mcm (\$2.40/Mcf), which is the world market price. Because of transportation agreements with Russia, the gas is sold to Ukraine at \$40/Mcm (\$1.10/Mcf), a highly discounted price. If CBM must compete with Russian gas at the discounted price, the industry will have a very difficult time gaining a foothold because of its high production cost. CBM simply cannot compete with gas in the range of \$1.00 / Mcf, but should be a

viable energy source at the higher world price of \$2.40 / Mcf.

Coupled with the supply and price situations are problems with distribution and marketing of natural gas. It is common knowledge and practice that gas bills are not paid. The perception that the Russian gas is free is rampant caused by lack of enforcement of gas sales contracts. The major offenders are the many large state-owned industries that are scattered around the country. The new government has announced that it will address this problem as well.

In the face of these problems, it is encouraging to note that there is an extensive natural gas infrastructure with a significant amount of the energy provided by natural gas. If the reform movement can bring natural gas marketing and distribution into a true market economy, the physical markets for CBM will be readily available.

C. The Ukrainian Coalbed Methane Resource

There has been extensive work on characterizing Ukraine's CBM resources. The Donbass Basin is the location of most of the coal industry. The coal mines of the region have been fraught with severe methane gas problems since the inception of the industry. Mine explosions caused by excessive gas in the workings have rendered Ukrainian mines as among the most dangerous in the world. Coal mining deaths remain at the levels they were at 10-years ago when coal production was considerably higher than today.

An unusual geologic phenomenon is present in this basin -- porous sandstone beds lie between the coals. These sandstone formations are at least partially saturated with gas. This makes for a dangerous gas situation; as the coal is removed, conduits or fractures are created that allow migration of these trapped gases into the coal workings where its mixture with ventilation air can become explosive.

Because of the severity of this problem, Ukraine has been one of the early developers of coal degasification techniques. These techniques allow for capture of a portion of the methane gas either in advance of mining or coincident with mining. These techniques, designed to keep the gas out of the mine ventilation systems, allow capture of methane at concentrated levels that will allow the gas mixture to be utilized as an energy source. A small amount of this captured gas is now being used as motor fuel and stationary boiler fuel in the mine areas.

Because mine design has been heavily burdened with gas hazards, mapping and compilation of the methane resource has been extensive. The published resource base of 1.2 Tcm (42 Tcf) of gas in the basin down to a depth of 1500 m is significant. This number is inclusive of only the gas contained within the mapped coal seams. It must be pointed out that the 1.2 Tcm estimate was computed using Ukrainian evaluation methods that are different from the standard western methods. However, there have been enough investigations by respected western experts to be reasonably certain that there is a significant resource available for exploitation. While the exact quantification of the resource is still in question, there is without doubt an ample resource to warrant

attention of CBM developers. Some Ukrainian experts estimate the total CBM resource at as high as 30 Tcm, but more likely between 6 and 8 Tcm.

This dangerous mining situation may present economic opportunities for the drilling of CBM wells that can exploit this methane gas sourced from the coal seams and trapped in the sandstone reservoirs. At a minimum, coal seams should be developed as gas reservoirs to recover some of the massive CBM resource.

Geologically speaking, although the individual coal seams in the CBM regions are thin (less than 2m thick), collectively they represent a significant thickness. The coals are relatively deep at 1200 – 1500 m (3500-5000 ft) compared with ideal depths in the range of 300-1000 m (1000–3000 ft). Generally speaking, the presence of many thin coal seams scattered over a large vertical interval present technical challenges with casing, perforating and stimulating the coal seams (well completion). These usually result in low recoveries of the gas in place. The presence of porous sandstone beds in the intervening intervals may mitigate this completion problem. Unfortunately, there has been no technical demonstration of the proper completion methods in Ukraine. There remains significant technical risk in producing CBM in Ukraine on a commercial basis. Optimum drilling and completion methods must be developed. This can be done only with hands on experience. While there is little doubt that techniques can be developed that will allow methane to be produced, their economic viability must be proven.

D. Interest and Commitment to the Coalbed Methane Resource

Recognizing the need for a national energy program, the Ukrainian Rada approved the formulation of a National Energy Program in 1996. CBM has played a large role in that program with significant estimates of future production. In 1997, the Cabinet of Ministers resolved to implement more specific measures to increase CBM utilization, setting production goals of 6 Bcm/yr (212 Bcf/yr) by 2005 and 8 Bcm/yr (283 Bcf/yr) by 2010.

These are aggressive goals, but they do represent a strong statement of commitment to the resource. In order to achieve these goals a very ambitious investment program must be put into place in the very near future. Using world development costs of \$0.3 – 0.5-/Mcf of reserve developed, US\$600 million to US\$1 billion will have to be invested to meet the production goals. The probability of that happening by 2005 is low, but it may be feasible to achieve that production level over a longer time period.

The evaluators interviewed many senior government officials, finding them to be remarkably well informed on the potential of CBM. Even the past and present members of parliament interviewed proved to be very astute about the potential of the resource and view it as one of the most viable energy sources that can have an impact on their energy supply situation. They appear to be committed to advocating legislative and regulatory reforms to accelerate CBM development on a commercial basis.

E. Ukrainian Coalbed Methane Technical Expertise

The evaluators met with several of Ukraine's leading CBM experts. It was observed

that Ukrainian CBM expertise has been developed around the effects of methane on the design and operation of coal mines. There has been considerable work centered on estimating the amount of gas in place and mitigating its effects on mine operations. This led to a well-defined resource base in the Donbass Basin.

The techniques used to drain the methane gas are cross seam boreholes from inside the mine and vertical gob drainage wells located along the long wall panels. Little or no technology has been developed to drain the methane directly from the coal seams ahead of mining. This is the technology needed to develop a significant gas supply from CBM.

The evaluators could find no case where coal located in a vertical well was completed in the coal reservoir. The only demonstration of vertical wells drilled in advance of mining have been completed in sandstone reservoirs adjacent to the coal seams being mined. It is these reservoirs that have been exploited with the small scale utilization projects of motor fueling stations and stationary boiler applications. These completed wells were accomplished with very low cost techniques that do not require modern stimulation design and equipment.

The value of these projects should not be overlooked because they can have a significant effect on the mine operation and may remove some of the hazards created by gas outbursts and explosions. They are definitely a legitimate mine degasification technique, and may be very effective. However, they are applicable to only a very small fraction of the area to be mined.

In order to be counted as a gas supply option, the CBM must be exploited over a large area. With the characteristic of thin coals scattered over a large depth interval, the only viable completion method is to drill through and complete multiple seams using modern stimulation technology. The difficulty of this cannot be overstated; it is one of the most difficult problems in all of petroleum technology.

Recognizing the need to demonstrate the economic viability, the MCI has initiated a series of pilot projects. The MCI envisions five pilot areas to demonstrate the technical and commercial viability of CBM.

The evaluators visited the first of the pilot projects to obtain funding. It is located on the license area belonging to the AFC. One exploration well has been drilled and one production well is in the process of being drilled. Drilling has been progressing for eight months using antiquated mud based drilling equipment. This approach is in contrast with CBM developments all over the world that have proved that the optimum drilling technique is to use air drilling with modern drilling equipment that could drill the same wells in 3-7 days. Further, the method, which has been drilling on these coal seams for months, is causing very deep and damaging invasion into the fracture or cleat system. Many times, wells drilled slowly with mud have proved virtually impossible to complete and are rarely economic.

The experts operating this program are coal mining geologists and engineers. None that were interviewed have experience with modern completion technology. Further, there is no modern service system that can provide the equipment necessary to make these wells viable.

It is the experience of the evaluators that the efforts expended in these pilot endeavors will be heavily discounted by any sophisticated CBM investors and may even be a detriment to ultimate full-scale development. If the objective is to truly create a significant gas supply in a short time frame of 5-10 years, the evaluators discourage further investment in these pilot programs. If the supply can be developed over a 20-year period, then it can be developed using indigenous experience that, by necessity, must be developed slowly.

One way to achieve the stated CBM production goals is to have a large and rapid infusion of western technology and equipment. This will happen only if the investment climate is right. For that reason, highest priority must be toward reform of the legislative, tax, regulatory and market policies.

F. The Alternative Fuels Center

The Alternative Fuels Center (AFC), a for profit state joint venture, was created on December 30, 1997 by a joint order issued by the MCI of Ukraine and the NAS of Ukraine³. The AFC has a very broad charter⁴ that covers the full range of activities from scientific research to commercial project development and implementation. Likewise, it is chartered to conduct activities for the full range of hydrocarbon-based "alternative fuels" including:

- Recovery and use of coalbed and coal mine methane and other hydrocarbons;
- Extraction and processing technologies;
- Biogas;
- Programs to support reduction of greenhouse gas emissions including emissions trading initiatives; and
- Fuels that can substitute for oil and gas.

Recognizing the large potential for capturing and utilizing CBM in Ukraine and the importance of CBM emissions as a greenhouse gas, USAID signed a Memorandum of Understanding (MOU) with the MCI and NAS to assist the AFC in coordinating common initiatives "to promote increased private investment and technological development of coalbed methane programs."⁵

³ Ministry of Coal Industry and National Academy of Sciences Joint Order #586/304, December 30, 1997.

⁴ Undated joint document issued by National Academy of Sciences and Ministry of Coal Industry, "The Center for Alternative Fuels of the National Academy of Sciences and the Ministry of Coal Industry of Ukraine," 1998.

⁵ Assistance to the Alternative Fuels Resource Center, Memorandum of Understanding Between the

Initial USAID funding to start-up and support the AFC was provided through its contractor Burns and Roe Enterprises, Inc. On October 1, 1998, after the Burns and Roe contract with USAID ended, the responsibility for managing all USAID support to the AFC was transferred to PIER, a U.S.-based non-governmental organization (NGO) with broad expertise in the coal industry.

SECTION III - Analysis

A. Assessment of the Operational Activities of the AFC

1. Rationale for Creating the AFC

In large part, the USAID involvement in the AFC was to be the driver for reforms needed to develop a CBM industry in Ukraine. It was envisioned that it could help coordinate the legal, regulatory, and research programs of the many governmental and other organizations.

Even with the recent restructuring of the Ukrainian government to consolidate several Ministries into a new Ministry of Fuel and Energy, the AFC's original founding principles are still valid. With all of the pressing priority issues facing Ukraine today, initiatives and interest in CBM would likely fade without an organization like the AFC to keep it on the government's agenda. Likewise, its role as coordinator and overseer of CBM activities in Ukraine continues to be critical. Creation of the Advisory Board is considered a major breakthrough that is enabling the many players in the Ukrainian government to work together in meeting common CBM-related objectives. The advisory Board is discussed in more detail below.

2. Operation and Relationships

At the time of the evaluation, it was found that the AFC was polarized in its management and activities. The Director, V. Kasianov, and Assistant Director, A. Priyeshkin primarily handle the business aspects of the Center. The Technical Support Group is comprised of S. W. Lambert, I. Kurshak and I. Bogomolova, S. Katsarov and O. Kazak and responsible for implementing the MOU by organizing and administering work of the Advisory Board, establishing a library, providing training and publishing a journal of CBM activities in Ukraine. The director and assistant director pursue the "for profit" activities of the Center and the Technical Support Team provides the functions of information gathering and dissemination, publications, training, and legislative initiatives.

The "for profit" side of the AFC has been selected to coordinate the Ministry of Coal Industry funded CBM pilot project that consists of 5 separate demonstrations of various means of producing and using CBM. To date, only one of the pilot projects has progressed, that located in an area leased to the AFC. The first production well is being completed. However, significantly less than expected funding for the project from the MCI has threatened to seriously delay (and possibly cut short) this project. In addition, the use of antiquated drilling technology will likely produce poor results that will not build investor confidence, as it was intended to do. Although the potential exists for creation of a venture with an investor to complete the project, in light of the poor investment climate in Ukraine, and the low price of natural gas supplied to Ukraine from Russia, this seems unlikely. In addition, with the recent restructuring of the Ukrainian government, including the downsizing and downgrading of the former MCI, and anticipated reductions in government spending, required future government funding for the project to become even more doubtful.

The AFC has also been designated the “Executive Agent” for a Pilot Project by the World Bank. The Global Environment Facility (GEF) is providing forty percent of the funding for the project as a grant. Little progress has been made on the GEF project, because no investor has come forward who is willing to provide the additional 60% funding that will meet the requirements of the World Bank.

The role of PIER is to administer the USAID funds and provide some planning and management functions. Shortly after the AFC was set up and operating, the USEPA contracted with the AFC to collect coal mine emission data. Here too, the funding was provided through PIER to US Environmental Protection Agency’s (EPA) AFC support team. The USEPA project is called an AFC project, yet is segregated both physically and functionally from the other AFC activities and personnel.

B. For-Profit Activities

Although the majority of the USAID funds provided for operation of the AFC are for the activities of the Technical Support Group, USAID also pays the salaries of several key staff in the “for profit” side. Specifically, the MOU requires USAID to provide the salaries of:

- the Center’s Program Director,
- an Information Specialist to establish and maintain the resource library, computer databases and manage journal publication responsibilities, and
- the Administrative Assistant to provide secretarial support.

In fact, currently two positions in the “for-profit” side of the AFC are being supported by USAID – those of the AFC Director, Vladamir Kasyanov and its Deputy Director, Anatoly Priyeshkin. It is reported that both of these gentlemen devote most of their time to projects that support the AFC’s “for-profit” activities. Very little of their time is devoted to supporting the programs of the Technical Support Group.

Until now, the “for-profit” side of the AFC has focused nearly all of its activities towards CBM. However, although it is understood that some activities not related to CBM may be underway at the AFC, the evaluators did not have access to information on them. As mentioned earlier, this side of the AFC is coordinating the MCI CBM pilot program and is the Executive Agent for the World Bank/GEF project. Neither of these projects appears to be progressing very well.

Early experience of the “for-profit” side of the AFC as a consultant to private sector investors potentially interested in developing CBM projects in Ukraine has had limited success. The complaints received from companies who hired the AFC or worked with them in developing projects include:

- Very high fees for information
- Key information being withheld

- Competition from the AFC for licenses and information creating conflicts of interest
- Difficulty in separating the AFC from the MCI – as an arm of the MCI, some believe the AFC to be no more than a Ukrainian government tentacle that is influenced by the government.

As a result, it is unlikely that foreign investors will seek consulting support from the “for-profit” side of the AFC in the future, to assist them with CBM project development and analysis. On the other hand, the evaluators learned that two foreign companies have approached the AFC to obtain strategic advice and support. It is too early to assess the success of these activities.

The “for-profit” side of the AFC may continue to have success in attracting consulting projects from the Ukrainian government, like the feasibility study on coalbed methane production from the West Donbass conducted for the NAS. In addition, the AFC may be able to attract joint venture partners to develop lands that it has leased. However, these opportunities will be limited in the near-term because of budgetary problems in the Ukrainian government, the poor investment climate in Ukraine, and concerns over competition and conflicts of interest with the AFC.

With changes in the structure of the AFC, future revenue sources may be possible. If the AFC would abrogate its role of CBM project developer, it could attract projects funded by the private and public sectors. For example, once the climate is right for investment in Ukraine, the AFC may have success in the following areas:

- Providing data and analysis of CBM resources in areas of Ukraine
- Developing and promoting policy initiatives for improving the investment climate.
- Assisting in identifying and securing markets for product gas.
- Assisting in moving projects through the Ukrainian approval process.
- Providing support for obtaining emissions credits (developing baselines, verifying emissions reductions, negotiating allocation of emissions credits) from CBM and other alternative fuels projects.
- Conducting hands-on training in developing, drilling and producing CBM (using lease sites as demonstrations for training purposes).
- Providing evaluations of current CBM projects to define and undertake performance enhancements.

Furthermore, the AFC could pursue a broad range of activities for other alternative fuels. For example, in addition to performing the types of activities noted above for CBM, these same activities could be conducted for other fuels like biofuels and natural gas. Finally, AFC’s charter appears to afford it the opportunity to develop programs on the broader suite of technologies, including renewable energy and energy efficiency options.

C. Not-for-Profit Activities

The not-for-profit segment of the AFC is the Technical Support Group. The activities and staffing of the Group were previously described. In this Section, they will be evaluated to determine whether they met the objectives of USAID and Ukrainian government planning documents.

The primary planning document against which the performance of the AFC is evaluated is the MOU between USAID and the Ukrainian MCI and NAS. That document mandates six principal activities:

- Advisory Board
- Research and enhancement of investment issues
- CBM training
- Administration
- Library
- CBM Journal

To address these issues, the AFC developed a Work Plan that is periodically reviewed and updated, as needed. The Work Plan is submitted to PIER and USAID for review and concurrence. The current Work Plan is provided as Annex C. Annex D summarizes the accomplishments of the AFC. An assessment of the AFC's performance in each of these areas is provided in the following.

1. Advisory Board

a. Background

As envisioned in the MOU, an Advisory Board represented by a large number of Ukrainian Ministries, Committees, the Supreme Rada, and others would be created by the AFC to "promote CBM industry growth through lobbying efforts on specific gas production goals in Ukraine's National CBM Program." Further, it was the intention of USAID that the Board would participate in the development and implementation of program activities, and would develop policy recommendations for the Government of Ukraine on legislative and regulatory initiatives needed to improve the environment for investment in CBM. Quarterly meetings of the Board were proposed.

b. Status

Undoubtedly the most significant accomplishment of the Support Team has been the assembly and motivation of the Advisory Board. This group of 15 individuals, who were recruited from a much larger interagency work group, has formed a cohesive task force that identifies, develops and recommends to the government of Ukraine legislative and regulatory initiatives to support the development of CBM. The group is formed from 11 government agencies, the AFC Director, PIER, USEPA and the Supreme Rada

of Ukraine.

The evaluators interviewed a significant number of the members of this group. Each expressed amazement over the progress and accomplishments of the Board. The group has adopted a protocol for board work tasks. They have broken into sub-groups and assigned identified issues that relate to foreign investment. The work groups formulate plans to address the individual issues and bring these plans to the full board for discussion and revision, if necessary. Once adopted, the plans will be sent to the management of the proper government agency for legislative consideration at parliament level or for regulation revision or promulgation at the Ministry level.

c. Assessment

The AFC's accomplishments regarding the Advisory Board are nothing short of outstanding. It has successfully recruited 12 senior, knowledgeable and influential government officials (in addition to PIER and AFC members) to actively participate on the Board (membership list provided as Annex E). It has adopted by-laws (Annex F) and work procedures (Annex G). It has developed a draft Work Plan and has created Planning Committees to develop Work Plans to address each element of the Board's Work Plan (Annex H). Finally, it has developed comments on proposed legislation.

There are many advantages that the Advisory Board brings to the AFC and USAID's efforts to create an active CBM industry in Ukraine. For instance, it brings together senior representatives from each of the government organizations that have a role to play in CBM development. It has given the Advisory Board participants common ground to work together to meet common objectives in support of CBM, despite the varying interests of each. A consistent comment offered by Advisory Board members that were interviewed for this study is that for the first time, they are sitting on the same side of the table as their colleagues from other government agencies using their collective authorities and strengths to benefit the program. Through the Advisory Board, the AFC has succeeded in achieving government recognition of the importance of CBM.

Another unanimous comment offered by Board members interviewed for this study is that the CBM study tour to the United States that they participated in during June and July 1999 opened their eyes to the potential of CBM to achieve several important priorities of Ukraine. These priorities include: miner safety, domestic production of gas to displace Russian imports, environmental protection, and economic efficiency in the coalfields. Because of this experience, Board members have stated that CBM will continue to be a priority government topic.

Just as important, the Advisory Board has put in place plans to remove the major barriers facing CBM development in Ukraine and is committed and motivated to seeing its plans through to the end. More detailed, issue specific plans are now being developed.

Of significance was the interview with Mr. Yuri Samoilenko, an Advisory Board

member and a Member of Parliament and chair of the standing committee on environmental policy. He reported that he has assembled a coalition within Parliament that crosses party lines in support of the CBM reform initiatives. The Board, and hence the AFC staff, thus have access to an ascending Member of Parliament who can assist in getting Board proposals enacted into law.

The cost of supporting and maintaining the Board has been and is expected to continue to be very low. One AFC employee spends a significant amount of her time coordinating activities of the Board. Other AFC employees spend part of their time supporting the Board by translating information, researching issues, commenting on documents, and administering the effort. In addition, expenses were incurred for the two-week training tour of the Board to the United States and to provide some training for them in Ukraine. No money is provided to Board members for their participation.

Two issues associated with the effective functioning of the Board were identified in the course of the evaluation. First, no representatives from the financial community are represented on or consulted by the Board. Participation of an organization like the World Bank could add a perspective (and a potential source of funds) that could be valuable. Second, in the future, to fully support the needs of the Board, money would have to be allocated to allow the Board to conduct studies and analyses needed to support legislative and regulatory initiatives they pursue. The money would be used to hire capabilities that do not exist on the Board. The funds required to support these efforts are expected to be very small.

2. Research and enhancement of investment issues

a. Background

The AFC can play an important role in mobilizing comments on Ukrainian legislation, regulations and policies that could impact CBM development. The MOU categorizes this activity as a primary task of the AFC.

b. Status

As mentioned, the AFC, through its Advisory Board, has been very successful in identifying the major legislative and regulatory needs for CBM in Ukraine and in mobilizing plans to address them.

c. Analysis

The USAID funds were well utilized in this area. The AFC, in some instances with support of others were able to:

- Provide comments on the draft Law on Production Sharing Agreements.
- Complete a report on CBM in Ukraine that describes Ukraine's CBM resource, field activity, commercial-oriented partnerships, and government efforts to develop the resource, business, technical and other issues.
- Complete a Handbook for the formation of a Ukrainian/US joint venture for

the production and marketing of CBM.

- Complete a guidebook on the licensing procedure for CBM in Ukraine.
- Propose inclusion of CBM in the Draft Law on Alternative Liquid and Gaseous Fuels which was accepted in the law that was enacted in January 2000.
- Is working closely with the Advisory Board to ensure that important issues pertaining to CBM development are assessed and addressed.

The AFC is covering this activity very effectively as it works with its Advisory Board on legislative and regulatory issues. The AFC should update its Work Plan to reflect the effort it (through the Board) plans in this area.

3. CBM Training

a. Background

The MOU calls for short-term, in-country training by U.S. experts of Ukrainian mining and gas industries and study tours to the U.S. for Ukrainian government and industry officials. Specific topics for in-country seminars were specified.

b. Status

The Technical Support Team has developed training opportunities for Ukrainian engineers, geologists and regulators on topics such as: technical standards, project design methods, regulatory and legislative incentives, coal mine safety and environmental issues. About 100 Ukrainian professionals attended these seminars.

c. Analysis

The AFC has provided several very useful seminars to Ukrainian CBM specialists and conducted a very successful study tour to the U.S. for the Advisory Board. Seminars were held on the following topics:

- CBM resources evaluation methods
- CBM engineering and software application
- Regulatory, coal mining safety, and environmental issues involved in CBM well development and operation
- Hydraulic fracturing in multi-seam coal reservoirs: concepts and practical considerations.

During the Advisory Board training tour in the U.S., a variety of seminars and site visits were provided. For example, the following seminars were conducted:

- CBM business concepts

- Cash-flow measures; time value of money
- CBM project costs and rate of return
- Exploration of uncertainties – risks and rewards
- Exploration, development and production economics
- Regulatory issues affecting CBM in the US
- Procedures to identify, value and bid CBM leases on Federal lands.

Each of these seminars and the site visits (which are documented in the AFC library) was very effective in educating Ukrainian officials on the practical issues facing CBM development and how they were addressed in the US. In addition, the seminars and site visits were the catalyst for creating a strategy for the Advisory Board (as reflected in its Work Plan) and to equip Ukrainian officials with practical tools for supporting CBM decision-making. Continuation of similar types of training activities will provide the Ukrainians with the basic tools and expertise needed to ease development of its CBM industry.

Several future seminar and training priorities emerged from interviews conducted for this evaluation. They include:

- The effects of CBM recovery on coal mining activities. Coal miners and mining companies in Ukraine are concerned that CBM extraction operations in advance of mining will adversely effect their ability to mine the coals. A seminar on the U.S. experience in this area should be designed to dispel this myth.
- Business aspects of CBM development. Ukrainians are technically versed on CBM. However, as is to be expected, they suffer from lack of understanding of the business aspects of the industry. Seminars on all aspects of putting a CBM business deal together are needed.
- CBM project management. There are many issues associated with properly managing a CBM project that could affect its success. Lessons have been learned from U.S. experience that could benefit Ukraine as it attempts to develop the industry.
- CBM study tour to the U.S. In the summer of 1999, the AFC sponsored a CBM training tour to the U.S. for members of its Advisory Board. The success of that tour was immeasurable. A follow-on tour for the Board and key Ukrainian government decision-makers should be planned. As part of this tour, a meeting should be planned at which the Ukrainian government

solicits suggestions from U.S. CBM developers on mechanisms to quickly get U.S. companies to invest, provide technology and train for CBM development in Ukraine.

- English study. Continue the practice of providing English lessons to Advisory Board members. During the course of the evaluation, many people commented on the importance and value of these lessons to simplify the communications between the U.S. and Ukraine on complex CBM-related topics.

4. Administration

a. Background

The MOU recognized that considerable effort would be required for the AFC staff to coordinate and plan its many activities.

b. Status

USAID Funded Technical Support Group. The staff that has been assembled for the Technical Support Team is headed by Steve W. Lambert, CBM expert and expatriate from the U.S. Mr. Lambert manages the day-to-day activities of the Team. He holds advanced degrees in geology and has over twenty years experience in CBM. He has been in Ukraine for about three years. Mr. Lambert is well respected by the Ukrainian and foreign organizations that were interviewed. The evaluators found the staff responsive to his leadership, and our information requests were completed in a professional manner.

An important member of the staff is Irene Kurstak, senior technical analyst who coordinates the interaction with government agencies, including the Advisory Board. Another key staff, Irina Boglomova, administrative assistant, coordinates the Journal publication, library organization, web site updates, and office expenses. Also part of the Support Team is Alexander Katsarov, Information Officer, who tends to the computer maintenance in the office, physically maintains the website, publishes the Journal and serves as programmer. Oleg Kasak translates documents and training manuals for inclusion in the library and for use in training courses.

USAID Funded Director Staff. Also located in the AFC office and funded by USAID are the Director Vladamir Kasyanov and Assistant Director Anatoly Priyeshkin. As previously discussed, they spend the majority of their time on the “for-profit” activities of the AFC.

MCI/NAS Funded Director Staff. Located in the AFC office, but funded by MCI/NAS, are three individuals: an accountant, a receptionist and a driver. The evaluation team did not interview these individuals because they were beyond the scope of the evaluation.

USAID Funded PIER Staff. Located separately, but near by, is the PIER office that houses Jerry Triplett, resident PIER manager. Supporting the manager are Sergey Loga,

translator and Valeriy Kaydan, administrator. In addition, PIER has a field office in Donetsk. This office employees 3 people and is also managed by Jerry Triplett. The evaluators were advised that, as of January 15, 2000, none of the Donetsk employees should use USAID funds associated with the Technical Support Group. PIER/Donetsk continues to receive funding under USAID's Climate Initiative.

USEPA Funded Technical Staff. Also located in the PIER office in Kiev is a two-man team, headed by Alexander Fillipov. They perform the technical tasks for the USEPA project. They are supported by the PIER employees in Donetsk. Interviews with the project leader show him to be conscientious and competent. Mr. Roger Fernandez, EPA Coalbed Methane Outreach Program Director volunteered his high level of satisfaction with the work of this group.

Office Facilities.

The AFC office space is fully utilized with adequate furnishings. Space is at a premium, but the office has a neat appearance and the team displays a high energy level with lots of activity.

The office is self-sufficient having furniture, computers and storage space for all. In addition, printing equipment purchased with USAID funds appears to be adequate for the needs of the AFC.

The PIER office in Kiev is also fully utilized and has adequate furnishings, including computers. The USEPA CBM support team is housed in the PIER Kiev office.

The PIER office in Donetsk is very large for the number of staff it has resulting in several vacant offices (this is likely a result of the downsizing of the office within the last year). It too is fully furnished.

c. Analysis

For activities funded by USAID, the administrative functions of the AFC reside primarily with the Technical Support Group. Its functions include:

- Translating relevant documents to English and Ukrainian
- Maintaining the CBM library
- Maintaining the AFC web site
- Coordinating and staffing Advisory Board activities
- Preparation and publishing of the Journal
- Organizing and coordinating training

- Developing, updating and implementing the Work Plan for the AFC
- Responding to information requests from industry and government officials
- Facilitating potential foreign CBM investor interactions with Ukrainian officials
- Supporting other CBM initiatives not funded by USAID (e.g., USEPA projects, “for-profit” projects).

With the exception of supporting the “for-profit” side of the AFC, the administrative functions being carried out by the Technical Support Group are important and consistent with the intent of the MOU. The Technical Support Group staff was found to be competent, hard-working, dedicated, well respected, and easy to work with. They are proud of their accomplishments and have accomplished a lot.

Support to the “for-profit” side of the AFC appears to have been very limited. Technical support to the AFC Director has been provided on a few projects (e.g., CBM pilot project). In addition, the Technical Support Group assists in staffing the development of proposals that are submitted to potential funding sources. This has been a drain on the Technical Support Group. This support is valuable, but should be reviewed more closely to ensure that it doesn’t create a conflict of interest with some of its other activities (e.g., legislative and regulatory reforms).

The AFC Director and Deputy Director appear not to play an active role in the activities of the Technical Support Group. The Director is a member of the Advisory Board and attends its meetings. However, he does not seem to have great interest in either the Board’s initiatives or most of the projects being directed by the Technical Support Group.

Day-to-day interaction and coordination between the Technical Support Group and USAID and PIER appear to be lacking. In recent months, the Technical Support Group has been left out of planning and budget decisions. Relationships between PIER and the Group appear to be strained. Rather than working as a team they appear to be in competition for the limited funding that is made available.

On the other hand, both the USEPA CBM team and the Technical Support Group, although physically separated from each other, work closely together. On a daily basis, they communicate with one another and support each other, as needed.

5. Library

a. Background

The MOU between USAID and the MCI and the NAS calls for the AFC to create an information library. The library was to build upon information collected by Burns and Roe and PIER on legal and regulatory issues pertinent to CBM. In addition, it was supplemented with other information pertinent to CBM that would be gathered from

Ukrainian and other sources. Finally, the MOU called for the AFC to create an internet web-site on its activities.

b. Status

Both the library and web site have been created and put to use. The library is in both electronic and hard copy formats. The electronic format allows one to search for documents or contents desired. The hard copy files are color coded to enable easy access to information.

The library contains information on the AFC, as well as information on CBM-related legislation (domestic and foreign), and technical and other issues. It also contains a lengthy list of domestic and international CBM contacts that can be sorted for easy use. The library is well organized with retrieval of either English or Ukrainian documents readily available with most available either in hard copy or electronic form.

The website, www.afc.kiev.ua, contains up-to-date information on the AFC, as well as useful information about CBM in Ukraine. Currently, it can be used to access some of the documents that are located in the library. The information on the website is continually being expanded and updated.

c. Analysis

The evaluators found the library and web site to be very useful and of good value for the investment. Developers have used them as the starting point to gather the basic information needed to begin developing CBM projects. An especially valuable addition to the library is a handbook for potential investors. This loose-leaf document contains step-by-step procedures for investors to apply for required licenses, permits and regulatory approvals. The document even includes application forms for required permits and licenses translated into English. This handbook is kept up-to-date by monitoring government agencies that have jurisdiction over the many facets of CBM development.

Although the library and website have not been widely used, they are expected to be very important resources when the investment climate in Ukraine improves.

6. CBM Journal

a. Background

The MOU called for the AFC to publish a journal bi-annually focusing on CBM investment issues. The Ministry of Coal Industry's printing facilities were to be utilized to publish the Journal

b. Status

Two issues of the Journal have been published. Each was distributed to everyone who was entered onto the AFC mailing list.

c. Analysis

The Journals were very professionally prepared and presented. The content was very good with a mixture of information on the AFC, CBM developments in Ukraine and other useful information.

D. Assessment of Services Provided By AID

1. Background

According to the MOU, USAID was to provide several services to support the AFC. These included:

- A 4-person Technical Support Group.
- Start-up costs for renovation of office space, equipment and furnishings.

In addition, USAID entered a cooperative agreement with Partners in Economic Reform to administer its funding of the AFC and for other CBM-related work funded by USAID and USEPA.

The Technical Support Group with its four AID-funded staff has been described in previous sections of this report. As a result, this section will focus on the other aspects of USAID support – funding for physical facilities and equipment and management support provided by PIER.

2. Status

Shortly after its creation, the AFC secured office space for its entire staff – the people working on both the “for-profit” and “not-for-profit” elements of its program. Consistent with the MOU, the Ukraine government provided funding for the rent for the office and USAID funds were utilized to purchase office equipment, furniture and printing equipment. In total, \$207,350 of USAID funds were used to purchase equipment and furniture for the office.

PIER maintains a separate office to house its 3 employees and two USEPA-supported staff. In addition, PIER maintains a large office in Donetsk used to house its 3 full time staff who are located there (note, PIER’s Ukraine Director uses this office when he is in Donetsk). Since the evaluators were informed that the Donetsk staff were no longer being supported by USAID CBM funds, used to fund the AFC, no assessment of this group was conducted.

3. Analysis

The equipment and furniture purchased for the AFC appear reasonable and modest. The funds expended for them also appear reasonable.

The evaluators are of the opinion that PIER adds little substance as administrators of USAID’s funding to the AFC. During the course of the evaluation, it was observed that PIER was not actively involved in the current projects of the AFC. In fact, it appeared to be in competition with the AFC for the limited funds that have been made available

for CBM-related activities funded by USAID and USEPA. For example, the evaluators question PIER taking the lead on a newly funded project to measure methane emissions from cattle near Chernobyl. Likewise, the evaluators question the decision of PIER to undertake a new project to develop business plans for CBM projects in isolation. Joint management of the project with AFC would provide valuable training of AFC staff on the business side of CBM.

Day-to-day working relations between PIER and the AFC appeared to be strained and coordination between them was lacking. For example, it is the understanding of the evaluators that PIER drafted the latest budget proposal for the AFC without much discussion with the AFC.

PIER, although highly qualified in coal mining operations and mine safety, does not have expertise in CBM to offer the current USAID project. Very few of those interviewed during the course of the evaluation were of the opinion that PIER had been a substantive participant in the CBM activities of the AFC. To be fair to PIER, it must be pointed out that funding for its principal activities – coal mine-related issues, especially coal mine safety – were recently terminated by USAID. PIER appeared to do an excellent job on these projects and favored great respect from the coal industry in Ukraine. However, now that funding is available to support only CBM, the evaluators question PIER's role, especially if USAID funding must be cut further.

The budget breakdown for the annual costs associated with USAID support to the AFC was not provided to the evaluators. As a result, an assessment of the costs could not be completed. However, information made available to the evaluators on a proposed budget for continued support to the AFC indicated considerable costs for PIER staff and facilities that were a high proportion of total funding for the project and that appeared out of line with the limited substantive support they provide.

E. Future Revenue-Generating Options

Opportunities exist for the AFC to be self-sustaining. In general, the options identified include:

- Ukrainian government funding
- Private industry contracts and joint venture agreements
- Foreign government funding
- Multi-lateral banks
- United Nations, and
- Foundations and other not-for-profit organizations.

As previously mentioned, the Ukrainian government already has been a source of funding to the AFC for several projects, including the MCI pilot project. However, the government has not been a reliable funding source because as general budgets decline, support to the AFC does as well. It is likely that over the next few years, funds available from the Ukrainian government will decline further as the country tries to

address its economic problems. Therefore, it cannot be considered a good prospect, at least for a few years.

Because of concerns over conflicts of interest and AFC competition for CBM projects in Ukraine, and because of the poor investment climate, funding from private sector sources is also unlikely. In the future, once the investment climate improves and foreign investment in CBM rises, the private sector may be the primary source of AFC funding. Funding could come from developing joint venture relations to develop, operate and own CBM projects. This is a longer-term, but potentially lucrative option that will require the AFC to select one partner with whom to develop projects. Or, it could receive funding from consulting services provided to obtain data, and support development and operation of projects. However, this option would require the AFC to relinquish its CBM project development role.

The AFC has been successful in securing foreign government funding from the USAID and USEPA. Other governments may have interest in contracting with the AFC as well. Countries with CBM industries of their own or with interest in looking for greenhouse gas emissions credits may be interested in the AFC to conduct studies, provide data, or otherwise support its interests. The AFC should contact appropriate foreign government agencies to determine their interest.

The AFC has also been successful in attracting projects from multi-lateral banks. The World Bank and the GEF, for example have working agreements with the AFC. These organizations could continue to be sources of funding for the AFC to support CBM reform, management of CBM projects, studies and other purposes.

The United Nations may also be a source of funding for the AFC. The United Nations Development Program provides funding for energy and environmental activities including institutional reform, capacity building and environmental protection. The United Nations Environment Program provides support on a range of environmental issues. The United Nations Foundation also provides funds for greenhouse gas project initiatives.

Foundations and other not-for-profit organizations at times can be sources of funding. Many of them are interested in environmental issues. Others focus on economic development. The AFC's activities in CBM could fit either of these categories.

Two key problems arise from attempting to secure funding from any of these sources. First, it requires resources to develop proposals, conduct proposal-supporting analyses, and create the networks needed to identify and secure project leads. Secondly, it takes time to secure funding. Project leads must be identified, proposals written, and projects initiated. It is not inconceivable to wait 2-years or more for revenues to flow from the time a consulting project is conceived. Commercial development projects can take even longer.

SECTION IV - Findings and Conclusions

A. FINDINGS

This section of the report summarizes relevant determinations that are factual observations, consensus opinion of the persons interviewed or, the result of evaluation analyses discussed in the foregoing sections. These findings serve as the basis for the conclusions and recommendations, which follow.

1. The National Situation

The Ukrainian economy is severely depressed. The GDP has had a negative growth rate since independence in the early 1990's. Sectors of the economy simply do not have any cash. Workers are not being paid. Barter seems to be a way to survive, with the government even instituting barter schemes. As an example of its problems, the government failed to make international loan payments that were due in early 2000. There seems to be little hope for significant investment capital from domestic sources for any type of CBM development.

There is anticipation of significant reform in the government. There is an atmosphere of optimism, particularly among those in the private sector, that there is real opportunity for reforms to be passed by the current government. For the first time since Ukraine's independence, the executive branch and parliament appear to be aligned such that a majority can be achieved to implement reforms that will lead to a market economy.

There is significant knowledge and interest about CBM within the government. Governmental interest is exemplified by the resolutions, decrees, and even laws passed. The formation of the Advisory Board of the AFC has galvanized some of this interest into action to influence legislation that will allow CBM investment to take place. This interest extends to high level officials in parliament raising hopes that reform measures may be enacted.

2. The Existing Coalbed Methane Industry

There is a high probability that the CBM resource is of sufficient size to sustain the anticipated development. The published estimate of 1.2 Tcm (40 Tcf) of CBM resource is probably conservative. There has been ample work within the Ukrainian coal mining community to support the resource assessment. Further, there have been adequate checks by respected western experts that corroborate the results of these assessments. Some experts believe the total resource is as high as 30 Tcm.

Indigenous Ukrainian technical capability and equipment is antiquated. The techniques needed for a large CBM industry in Ukraine have not been tested. The only coal degasification that has been achieved to date has been from conventional sandstone reservoirs that occur geologically close to the coals being mined. The indigenous oil

and gas service sector has deteriorated due to neglect to the point that it is nearly non-existent. However, there are many intelligent CBM experts in Ukraine who have the capability to lead commercial development of a CBM industry. However, they are in dire need of training, technologies and financial resources.

There is a ready market for produced CBM. There is an extensive natural gas infrastructure throughout Ukraine and particularly in the Donbass region where a good portion of the CBM will be developed. There are existing and developing markets in the area that could absorb a considerable amount of the CBM to be developed. The industrial area around Donetsk probably can absorb some gas of non-pipeline standard by direct sale. On the national level, the gas market is dominated by imported Russian gas.

There are significant technical, economic and political risks facing project developers. The technology to economically produce CBM from the Ukrainian resource has never been demonstrated. Current attempts to demonstrate this will probably fail or may never reach fruition in a reasonable time period. The market situation is uncertain with the geopolitics involved in the Ukrainian natural gas markets. Further, the ever-changing political climate in Ukraine is a hurdle to investment. The market situation is further confused by the fact that a large portion of the gas used is not paid for. This situation presents a severe market risk for any large volumes of gas that may have to be marketed on the national scene.

3. Alternative Fuels Center – Functions

The AFC, as it is now organized and operated, presents a conflict of interest. The overall role of the AFC is to promote the formation of a CBM industry within Ukraine. This is to be facilitated by providing information, technology, and legislative and regulatory initiatives to potential project developers and investors. On the other hand, the AFC has been designed to be a project developer who would be in competition with its potential clients, a situation that has had a detrimental effect on the presence of a significant investor group. Further, the activities of the Advisory Board in lobbying and introducing legislation and regulations that will enhance the performance of projects owned by the AFC could be viewed as a conflict-of-interest.

The Technical Support Group is providing significant value. Of most significance was the creation of the Advisory Board that is influencing, and has the opportunity to further significantly influence the investment climate for a CBM industry. The novel approach has galvanized a diverse group of government agencies into actions that they can accomplish through a cooperative effort. The work of the Technical Support Group is also viewed to be important to provide the technical and regulatory information needed by investors, when the investment climate is right. These activities include the investor's handbook, the CBM Journal, library, and web-site.

The pilot demonstration projects will not provide value to the formation of a viable CBM industry in the short term of five years. The five MCI funded pilot projects are behind schedule with funding cuts and slow performance. Western investors will

severely discount any results because of the lack of experience of the personnel and the antiquated equipment used. Negative results from these pilots could be a detrimental factor in the evaluation of investment opportunities in Ukraine by potential future investors. The GEF project is likely to be withdrawn by the World Bank because of lack of a qualified investor that can perform the project.

4. Alternative Fuels Center - Organization

The work of the AFC is not focused. The AFC has conflicting objectives of making profits and supporting the creation of a CBM industry. Proposals have been made to focus more of the Technical Support Team activities on project support. This could interfere with its main task of creating the environment for development of a CBM industry.

Conflicting priorities within the AFC. The need to develop “for profit” activities has burdened the AFC with proposal development costs (both financial and personnel) that detract from the ability of the Technical Support Group to carry out its normal functions. In addition, high priority projects for the AFC Director and Deputy Director may be much lower priority for the Technical Support Group.

B. CONCLUSIONS

Based on the above FINDINGS coupled with extensive study, analysis, and experience, the evaluation team reached the following conclusions about major issues concerning the Alternative Fuels Center and its future role in the emerging CBM industry in Ukraine.

- The only realistic source for near term investment capital for CBM development is from foreign western investors and project developers. This will not occur without significant legislative and regulatory reforms.
- The “for profit” activities of the AFC (i.e., CBM project development) need to be separated from the role of the Technical Support Group.
- The Technical Support Group has provided value that could lead to creating a CBM industry in Ukraine. Future funding would allow it to continue its efforts.
- There are means for reducing the costs of the support from USAID, if necessary. For example, PIER could be replaced with an organization that could manage USAID’s funds for the AFC at lower cost. However, effort should be made to prevent a gap in USAID funding to the AFC. A funding gap could result in loss of key staff and loss of momentum of the Advisory Board.
- The Technical Support Group should be kept intact as much as possible. It should focus on the important tasks of legislative and regulatory initiatives, compiling and publishing information about CBM and training pertinent Ukrainian personnel

- Current pilot projects will not add significant value as demonstration projects.

SECTION V - Recommendations

As a result of the information gathered during the many interviews conducted for this evaluation, the following recommendations are offered. Each is discussed further in this section.

1. Reassess USAID financial support to the “for-profit” side of the AFC; provide funds only to the Technical Support Group.
2. As a cost-cutting measure, replace PIER as the agent for the AFC; limit the scope of work for the organization replacing it.
3. Focus the scope of work of the AID-funded Technical Support Group and merge it with the USEPA-funded support team.
4. Provide a minimum 3-year funding commitment to the AID-funded Technical Support Group; make funding contingent upon progress by the Ukrainian government in achieving reforms needed to attract foreign investment in CBM.

Recommendation 1 -- Reassess USAID financial support to the “for-profit” side of the AFC; provide funds only to the Technical Support Group.

In the course of conducting interviews for this evaluation, the evaluators learned of concerns over conflicts of interest that have been created as a result of the AFC being both a project developer and investment support organization. This conflict has already allegedly caused several CBM development companies to refuse to work with the AFC in the future because business confidential information they shared with the AFC was used by the AFC to benefit its business ventures. In addition, concerns exist with the conflicts that could arise from vested interests of the development side of the AFC using AID funding to seek legislative and regulatory preferences for CBM in Ukraine.

Therefore, it is recommended that USAID funds be used only to support the Technical Support Group, the “non-profit” side of the AFC. USAID’s funding of the AFC’s Director and Deputy Director should be reassessed since they are devoting much of their time to AFC revenue-generating ventures that are the conflict of interest concern. USAID should create a means by which to clearly separate the activities of the Technical Support Group and the rest of the AFC.

Recommendation 2 – As a cost-cutting measure, if needed, replace PIER as the agent for the AFC; limit the scope of work for the organization replacing it.

Considering the current funding available and the limited scope of USAID support to the AFC (i.e., CBM), it is suggested that the cooperative agreement with PIER as the USAID manager for the AFC project be terminated. PIER appears to offer little expertise on CBM and has not been actively involved in the program conducted by the Technical Support Group. The cost of maintaining PIER as the project manager is

likely to be a high percentage of the money that would be available from USAID for this project on an annual basis.

It is further recommended that care be given to limiting the scope of work of the organization which will replace PIER as the manager of the CBM Technical Support Group project with the intent of placing the substantive responsibilities with the Technical Support Group. The scope of work of the organization-replacing PIER should be limited to:

- Overseeing the expenditure of USAID funds by the Technical Support Group,
- Approving the annual work plans of the Technical Support Group, and
- Conducting periodic progress reviews to assess the performance of the Technical Support Group.

Finally, when implementing changes to its assistance to the AFC, USAID should avoid creating a gap in funding for the Technical Support Group. This could result in loss of key people and in the legislative and regulatory reform momentum it now has.

Recommendation 3 -- Focus the scope of work of the USAID-funded Technical Support Group and merge it with the USEPA-funded support team.

During the course of the evaluation, several priority areas were identified that should be the focus of future efforts of the Technical Support Group. Specifically, the following activities should be of highest priority:

- Support to the Advisory Board as it addresses the regulatory and legislative issues impeding creation of a CBM industry in Ukraine. The Advisory Board's work plan should be implemented. Work plans for each regulatory and legislative initiative to be pursued should be completed and used as the basis for determining the funding required for analysis to support the Advisory Board. Add the World Bank to the Advisory Board. Money should be allocated in the AFC budget to support the Advisory Board by hiring local staff as needed to assist in analyses to support its legislative and regulatory initiatives.
- Enhance and maintain the CBM library and AFC web site.
- Continue training of key technical, business and government officials in Ukraine. Priority should be given to training in the following areas:
 - 1) The affects of CBM recovery on coal mining activities. Coal miners and mining companies in Ukraine are concerned that CBM extraction operations in advance of mining will adversely effect their ability to mine the coals. A seminar on the U.S. experience in this area should be designed to dispel this myth.

- 2) Business aspects of CBM development. Ukrainians are technically versed on CBM. However, as is to be expected, they suffer from lack of understanding of the business aspects of the industry. Seminars on all aspects of putting a CBM business deal together are needed.
 - 3) CBM project management. There are many issues associated with properly managing a CBM project that could affect its success. Lessons have been learned from U.S. experience that could benefit Ukraine as it attempts to develop the industry.
 - 4) CBM study tour to the U.S. In the summer of 1999, the AFC sponsored a CBM training tour to the U.S. for members of its Advisory Board. The success of that tour was immeasurable. A follow-on tour for the Board and key Ukrainian government decision-makers should be planned. As part of this tour, a meeting should be planned at which the Ukrainian government solicits suggestions from U.S. CBM developers on mechanisms to quickly get U.S. companies to invest, provide technology and training for CBM development in Ukraine.
 - 5) English study. Continue the practice of providing English lessons to Advisory Board members. During the course of the evaluation, many people commented on the importance and value of these lessons to simplify the communications between the U.S. and Ukraine on complex CBM-related topics.
- d) Continue to periodically publish and distribute the *CBM Journal*.

In addition, it is recommended that USAID and USEPA agree to combine the Technical Support Group and the EPA support team. There is no reason that the evaluators can identify to keep these two groups from working together on their respective activities. Furthermore, the two groups have indicated a desire to do so.

If separation of the Technical Support Group from the "for-profit" side of the AFC is successful, future sources of funding for the Technical Support Group are possible. For example, once the climate is right for investment in Ukraine, it may have success in the following areas:

- Providing data and analysis of CBM resources in areas of Ukraine.
- Developing and promoting policy initiatives for improving the investment climate.
- Assisting in identifying and securing markets for product gas.
- Assisting in moving projects through the Ukrainian approval process.
- Providing support for obtaining emissions credits (developing baselines, verifying emissions reductions, negotiating allocation of emissions credits) from CBM and other alternative fuels projects.

- Conducting hands-on training in developing, drilling and producing CBM (using lease sites as demonstrations for training purposes).
- Providing evaluations of current CBM projects to define and undertake performance enhancements.

In addition, other sources of funding may be available to the AFC. These are discussed in Section III. These too should be pursued.

Recommendation 4 -- Provide a minimum 3-year funding commitment to the AID-funded Technical Support Group; make funding contingent upon progress by the Ukrainian government in achieving reforms needed to attract foreign investment in CBM.

During the course of conducting the interviews for this evaluation, many indicated their optimism that the new Ukrainian government may be successful in passing reforms needed to attract foreign investment. However, their enactment and implementation will take time. Therefore, to ensure that CBM is factored into government policies, USAID support for the Technical Support Group needs to be multi-year. It is recommended that this support be provided for a minimum of 3-years.

To better ensure that USAID funds will result in the desired benefits, its funding should be contingent upon periodic reviews to determine the progress made by the Ukrainian government in enacting reforms needed for attracting investments for CBM production. In addition, if USAID's must reduce its funding to the AFC, replacing PIER with a competent organization whose scope of work will be minimal, discontinuing funding for the "for-profit" side of the AFC and focusing the efforts of the Technical Support Group should reduce USAID's costs considerably. However, to eventually make the AFC self-sustaining, it should be allocated some money to enable it to identify funding opportunities and prepare proposals.

ANNEX A – Scope of Work

PROGRAM EVALUATION ALTERNATIVE FUELS CENTER (AFC)

SCOPE OF WORK

Summary

An evaluation of the USAID program that currently funds the operations of Ukraine's Alternative Fuels Center will be prepared for USAID/Kiev. The results of this evaluation are to provide USAID with: 1) a review of the existing organizational structure and management, the purpose being to determine whether these elements are consistent with the AFC goals; 2) recommendations regarding the long-term sustainability of the AFC.

Introduction

The Alternative Fuels Center (AFC) can be characterized as a combination of research office and information library designed to encourage and facilitate the commercial development of Coal Bed Methane (CBM) in Ukraine, although other alternative fuel types are envisaged to be incorporated within the AFC activity at some time in the future. The AFC is a Ukrainian legal business entity, officially registered in the State Register of Enterprises and Organizations as a Limited Liability Company by its original founders, i.e. the National Academy of Sciences (NAS) and the Ministry of Coal Industry, and is a "for profit" organization. As such, the center is focused on deriving monetary revenues from its activities, and is inherently motivated to establish business opportunities where the AFC will have a vested interest.

The AFC receives support from USAID and US EPA. The Technical Support Group, funded by grants from USAID and EPA to Partners in Economic Reform (PIER), a US non-profit organization, shares office with the AFC. The work of this group is also strongly focused on the commercial development of CBM, but unlike the "for profit" portion of the AFC, the research and information assistance they provide is open and free of charge to all interested parties, including the Ukrainian AFC business entity. This combination of "for profit" and "not for profit" activity presents unique informational gathering opportunities and management challenges for both sides.

Background

The amount of methane contained within Ukraine's coal beds is estimated to be approximately equal to 1.2 trillion cubic meters (42.3 trillion cubic feet). In addition to that contained within the coal, the high gas contents of the rock strata overlying and underlying the coals may easily more than double this amount. Also a hazard, it is understandable that the coal mines of Ukraine are considered among the gassiest and most dangerous in the world. On average, one death occurs each day due to methane-related mine explosions. Methane is also generally recognized as a potent greenhouse gas.

Although this energy resource is as useful as natural gas, only a very small portion of this gas resource is actually exploited, principally because of a lack of equipment and materials investment. Ukraine coal miners, for example, must deal with over 9 million cubic meters (318 billion cubic feet) of methane gas each day, most of which is vented and lost to the atmosphere. Only about 14% is removed from the coal using degasification techniques before and during mining operations, and only 5% of this amount is actually exploited and used as an energy source. This gas is being used successfully in Ukraine as fuel for vehicles, heating, generation of electricity, and for metallurgical production, but it represents a tiny fraction of Ukraine's needs for natural gas. With increased CBM recovery and development efforts, a substantial domestic resource of pipeline quality natural gas can be obtained. Ukraine currently consumes about 90 billion cubic meters (3.2 trillion cubic feet), 80% of which is imported.

Recognizing the large potential contribution to the domestic gas supply, Ukraine's Supreme Rada, in May 1996, approved the formulation of a National Energy Program containing projected CBM production estimates. Later, in 1997, the Cabinet of Ministers resolved to implement more specific measures to increase CBM utilization to almost 6 billion cubic meters (212 billion cubic feet) by 2005, then to 8 billion cubic meters (283 billion cubic feet) by 2010. Recognizing the large potential contribution to the domestic gas supply, Ukraine's Supreme Rada, in May 1996, approved the formulation of a National Energy Program containing projected CBM production estimates. Later, in 1997, the Cabinet of Ministers resolved to implement more specific measures to increase CBM utilization to almost 6 billion cubic meters (212 billion cubic feet) by 2005, then to 8 billion cubic meters (283 billion cubic feet) by 2010.

The Ukrainian Alternative Fuels Center

The Alternative Fuels Center (AFC) is a Ukrainian "joint venture enterprise", established in December of 1997 (by Order #586/304) between the Ministry of Coal and the National Academy of Sciences. It was established as a result of a Cabinet of Minister directive (Resolution #731, June 1997) to implement measures to increase CBM production in Ukraine. The overall mission of the AFC is to provide support toward realizing the CBM production targets identified by the Ukraine Government, and the AFC Charter does identify objectives that appear to facilitate informational, organizational, promotional, and business-related avenues that assist in meeting the development goals set by the Ukraine Government. The means to obtain these objectives/goals by attracting "non-budgetary" funding (as instructed by the Cabinet of Ministers Resolution #731, June 1997) is also included in the organization's chartered economic principles, as it describes the AFC as a commercial "for profit" business entity. In fact, the ability of the AFC to attract "non-budgetary" funds is readily demonstrated by the securing of USAID support in April 1998; and later US EPA, in September 1998, and by its chartered ability to capture revenue as a "for profit" organization, as demonstrated by at least one commercial contract (with Raven Ridge Resources, Inc). Also, the AFC's implementation plan for Ukraine CBM development appears consistent with that envisioned in the Coal Ministry-led response (Ministry of Coal Industry Memo #2-7256/68) to Resolution #731 in that the AFC has set specific courses of action that include the establishment of a high-level "Advisory" Group

focused on creating more advantageous CBM legislation; CBM resource reevaluations; and direct (government and commercial) involvement in pilot drilling programs.

The intended functions of the AFC appear fairly clear from the Ukrainian perspective, based on its evolution within government; and based on its statute and charter. The USAID perspective on intended AFC activities, specific to the technical assistance USAID provides, is best described in a Memorandum of Understanding (MOU) signed on April 6, 1998, between USAID, and the Ministry of Coal and the National Academy of Sciences (Ukraine) which defines the terms and conditions of this support, and the responsibilities of each party.

The MOU describes the overall purpose of the AFC as one of coordinating the efforts for utilization of alternative fuels in Ukraine, specifically CBM. The plan developed by USAID provides assistance to the AFC in the areas of promoting investment and technological development of CBM. The main vehicle of this assistance is through the financial support of a core (currently 4-person) AFC Staff: the AFC Director, AFC Deputy Director, and Information Specialist, and an Administer Assistant/Interpreter (the AFC provides at its expense an accountant, a receptionist, and a driver).

USAID supports a 4-person Technical Support Group (an expatriate CBM Resident Advisor, an Assistant to the Senior Advisor, a Ukrainian Mining Engineer located at the PIER office in Donetsk, and an Administrative Assistant).

The AFC Staff and the Technical Support Group together comprise what is referred to as the "Coalbed Methane Support Assistance Team" (the Team). This Team is generally charged to work within five areas of activity which are (1) promoting Investment Growth; (2) Training; (3) Administration, including coordination and support of all CBM work in Ukraine; (4) creation of a resource library; and (5) the publishing of a Ukrainian Methane Journal. AFC start-up, operations, and some training cost are also provided by this MOU.

The MOU calls for the establishment of an **Advisory Board** composed of representatives (non-supported positions) from several Ukrainian Government Agencies and donors working in the field of CBM. This Board is to participate in program activities, providing the AFC with important Government contacts as well as investment-related information. The MOU envisions this Board to develop recommendations on legislative initiatives and regulation issues related to CBM

The MOU requires that one Coordinator be designated from each of the founding Ukrainian Agencies (the MCI and the NAS). These coordinators (non-supported positions) are to assist the AFC Staff Director in several different functions, including liaison between the AFC and each founding agency; facilitating the gathering of data and other information; organizing Advisory Board meetings; and overseeing the policy measures recommended by the AFC and by the Board.

Based on the MOU, the cost of start-up (renovation, equipment, and furnishings) of the AFC was provided by USAID. This was implemented during the spring and summer months of 1998 via a contract with Burns and Roe Enterprises, Inc. which had been providing technical assistance to the Ministry of Coal Industries on CBM related issues in Ukraine since April of 1997. Burns and Roe's work up through the initial operation of the AFC is described in two final reports, which are available in the AFC Library. Burns and Roe provided and managed the USAID-supported Technical Assistance Group through to September 1998. On October 1, 1998, after the Burns and Roe contract with USAID ended, the responsibility for managing all USAID – supported elements of the AFC was transferred to Partners In Economic Reform (PIER), a US-based NGO.

Although a plan has not been clearly defined, the AFC's budgetary goal is to become financially self-sufficient within an estimated 2-3 year period, at which time USAID and EPA funding is currently planned to be either terminated or significantly reduced.

The AFC is located in the center of Kyiv within a building managed by the NAS Botanical Institute.

Scope of Work:

Task 1

The work in this task involves the specific identification of the current and required future operational activities at the AFC, inclusive of those provided by the entire USAID Coal Bed Methane Assistance Team (the Team). Once described, the contractor shall make an assessment of these activities, comparing them to those stipulated principally in the USAID / MCI and NAS Memorandum, and also in relevant USAID Planning Materials and Ukrainian AFC Charter and Statute documentation. Recommendations shall be made as to the Organizational Structure, its adequacy to meet the intended role of the AFC, and/or type and amount resources that would be required to fully accomplish these prescribed responsibilities.

Task 2

Work in this task involves an evaluation of the current and required future services provided by USAID, specifically those performed by the Technical Support Group. Once described, the contractor shall provide an assessment of these activities, comparing them to those stipulated principally in the USAID / MCI and NAS Memorandum, and also in relevant USAID Planning Materials. Given the work that this group has done to date, recommendations should be provided regarding near-term (calendar year 2000) composition of the Team to provide for the future needs of the AFC, and the value expected to be derived from this continuing support.

Task 3

This task requires the identification of a strategy which provides for the gradual phasing-out of USAID support, and - in light of very limited support expected from its founding government agencies - provides recommendations for capturing alternative sources of revenue, with the goal

being AFC financial self-sustainability. The work in this task is primarily to develop a plan which identifies and evaluates current and plausible future revenue-generating opportunities presented to the AFC, and would require development of a good familiarity with specific AFC plans (to sell services; receive lease and /or equipment concessions, and so on), and with those agencies and organizations that may offer feasible alternatives and revenue generating suggestions, such as US EPA, World Bank (the Global Environmental Fund), Ministry of Coal, State Committee on Geology, the AFC (and Advisory Board), PIER, and also field visits to selected CBM production / utilization sites.

Deliverables and Schedule:

The Evaluation Team will provide the following deliverables within the scheduled time frame indicated:

A Draft report and briefing to USAID/Kiev by end of the second week of the in-country visit

A Final Report delivered to USAID/Kiev 5 days after briefing

Qualifications of Evaluation Team

One senior organizational expert with a minimum of 15 years experience in management, preferably with expertise in managing non-government research and development organizations.

One senior expert with academic and professional background in a technical area or natural resources, preferably in the oil and gas upstream industry; knowledge of NIS economies preferred.

Level of Effort:

20 person days each, total 40 person days

Up to three weeks will be required in Ukraine, including a 2-3 day field trip to Donetsk by at least one of the team members. The purpose of this trip will be to observe relevant CBM extraction / production utilization operations. This will provide the team with 1st-hand knowledge of the state of need for material and equipment investment, a sense of potential for this resource, and also allow discussion for possible AFC revenue-generating ideas. (A visit to the MCI Pilot project location-also the location of the license area controlled by the AFC-should be included as part of this field agenda). Logistical support will be provided by the AFC Technical Support Team for the field trip.

Prior to the trip to Ukraine, 1-2 days consultations in Washington with USAID, PIER and World Bank (GEF CBM Pilot) are also required. These visits should focus on capturing these organizations perceptions of the AFC roles, responsibilities, and required work directions, but also include a discussion of possible revenue-generating activities for AFC sustainability. Overall, these visits are geared toward assuring consistency of expectation and performance of the AFC at both the Washington and Kiev field levels.

ANNEX B - Persons Interviewed

Those individuals interviewed to obtain views and information in the course of the project include:

U.S. Government

- USAID Kiev – Judith Schumacher, Thomas Broderick, Tatiana Kornilova, Dan Thompson
- USAID Washington, DC – Robert Ichord, Andres Doernberg
- US Department of Energy – Len Coburn – Expert of international energy market reform.
- US Embassy Energy Attache – Sally Kornfeld – Knowledgeable about energy issues in Ukraine.
- Environmental Protection Agency – Roger Fernandez – Funding climate change related activities through PIER and the AFC

USAID Funding Recipients

- PIER DC – James Randolph (Director)
- PIER Kiev – Jerry Triplett (Director)
- PIER Donetsk – Valentin Chukhalov (Deputy Director)
- Alternative Fuels Center – Vladimir Kasyanov (Director), Anatoliy Priyeshkin (Deputy Director), Stephen Lambert (Director Technology Support Group)
- PIER/AFC USEPA Project Coordinator – Alexander Filippov – Manages USEPA CBM program in Ukraine.

Financial Institutions

- World Bank – Heinz Hendriks, Konstantin Skorik – Proposed CBM demonstration project.

Private Sector

- Black Warrior CBM Corporation – Steve Blackburn – US developer who, at one time, actively pursued CBM project on Ukraine.
- Ravenridge – Jim Marshall – US developer who, at one time, actively pursued CBM project on Ukraine.
- International CBM Group – Ed Lassiter – Very knowledgeable US CBM expert very active in Ukraine; recipient of TDA funding for CBM project feasibility study.
- Advanced Resources International – Vello Kuuskra, Scott Stevens – US CBM experts who conducted training in Ukraine.
- Shell Central Europe Services Company Limited – Les Lastowecky – Very important player in gas industry in Europe.
- Howard Energy International, LLC -- Nikolai Lyassovoi – CBM developer and gas marketer.
- Taurus Energy International, Ltd. – Darrell Robertson – Natural gas marketing expert.
- BP Amoco – Dr. Jim Brown – Expert on gas exploration and production in Ukraine.

- Donugledegazacia – Dr. Valentin Konarev – Ukrainian expert on CBM.

Ukrainian Government

- Supreme Rada of Ukraine – Yuri Samoilenko – Member of Advisory Board.
- National Academy of Sciences of Ukraine – Anatoly Bulat, Vyacleslav Lukinov – CBM experts; Bulat chairs Advisory Board.
- Ministry of Economy – Larisa Konstantinovna – Member of Advisory Board.
- Energy Conservation Committee – Andrei Shchokin – Member of Advisory Board
- Ministry of Coal – Mykola Kaplanets – Member of Advisory Board
- Labor Safety Committee - Dmitriy Andeevich – Member of Advisory Board
- Committee for Oil and Gas – Natalia Kovalska – Member of Advisory Board
- Committee for Geology – Vladimir Ignatievich – Member of Advisory Board
- NAUREI – Valentina Mikhailovna

ANNEX C - WORK PLAN

PROJECT: Coal Bed Methane Commercialization

WORK PLAN FROM: October 1, 1998

DATE PREPARED: November 5, 1999

CONTRACTOR/GRANTEE: PIER

TO:

LAST REVISED: N/A

Goal: Promote increased private investment and technological development of Ukraine's Coal Bed Methane Resource, as described within the April 6, 1998 MOU between USAID, Ministry of Coal, and the National Academy of Sciences

COMPONENT 1: Legislative and Regulatory Development

Objective: Establish a mechanism in the form of an Advisory Board within the Alternative Fuels Center focused on developing policy recommendations on Coal Bed Methane legislative initiatives and regulatory issues related to the improvement of the investment environment.

<u>Issues/Constraints</u>	<u>Assumptions</u>	<u>Deliverables</u>
<ul style="list-style-type: none"> • No formalized incentive for Board member participation. • Tasks resulting from Board Actions constrained by limited available resource. • Full-time legal counsel not available to Board. • Government "legality" of agency-member participation is unclear. • Board member perspective largely limited to Soviet State-run viewpoint. 	<ul style="list-style-type: none"> • Supported meeting / training / meeting venues will provide incentive for continued participation. • Board-defined work tasks will be supported by expanded membership of donor agencies and commercial organizations sharing an ultimate common interest in building an attractive investment framework. 	<ul style="list-style-type: none"> • "Tool" for building legal and regulatory framework (AFC Advisory Board) • AFC Advisory Board "Letter of Intent", Organizational by-laws, and work plan • Agenda identifying key legislative changes and initiatives

Date(s)	Task	Comments
Feb 99	(a) Select Advisory Board members (Identify Agencies).	Twelve government agencies selected.
1 - 16 Mar 99	(b) Plan 1 st meeting agenda, and formalize Group via "Letter of Intent"	Eleven government agencies recruited
Feb - Jul 99	(c) Plan Training Tour to US; Train and Organize Group	CBM Economics / Organizational training completed in US; representation from Supreme Rada and Cabinet of Ministers included.
Jul - Sep 99	(d) Position Advisory Board as a recognized "forum" for consideration of CBM - related Investment issues	Advisory Board Members presented at CBM Conference, in Dnepropetrovsk, September 20-22, 99
Sep - Nov 99	(e) Complete draft by-laws for Board approval, including standardized group working methods and procedures	Draft by-laws completed, and circulated within membership Oct 99.

PROJECT: Coal Bed Methane Commercialization
 CONTRACTOR/GRANTEE: PIER

WORK PLAN FROM: October 1, 1998
 TO:

DATE PREPARED: November 5, 1999
 LAST REVISED: N/ A

Sep 99 – Nov 99	(f) Identify and complete specific work task recommendations (Table 1f); present draft Work Plan (task recommendations) to Board for further input regarding content, prioritizing, and scheduling, and Board approval.	CBM included within Draft Law on Alternative Fuels Sep 3; Resolution "On Development of CBM Commercial Production in Ukraine" approved Sep 6; Package of tax and fee incentives with Economy Ministry
Sep 99 – Mar 00	(g) Assist / Train Group in "Lobbying" efforts focused on Advisory Board-generated legislative initiatives	
	(h) Facilitate Advisory Board Meetings	USAID Technical Support elected as acting Board "Secretary" at first official meeting on Sep 22, 1999. Regular Meetings are to be held quarterly or as called according to by-laws.
	(I) Recruit Advisory Board Membership from Major Supporting Agencies and Commercial Interests, having a common goal of Enhancing Investment Opportunities through legislative change	US EPA and PIER Membership added on September 21, 1999

COMPONENT 2: Opportunity Recognition and Preparation of Investment Packages

Objective: Identify, prepare and package CBM Investment Opportunities that are commensurate with Ukraine's current "risk" investment environment

<u>Issues/Constraints</u>	<u>Assumptions</u>	<u>Deliverables</u>
<ul style="list-style-type: none"> Potential Ukrainian partners are not familiar with Western content requirements of investment packages for CBM projects High technical (low perm within major portion of resource area) and investment risks, in the areas of investor guarantees, ownership and control, and marketing Pilot Program Investment requirements / options not wholly determined by the implementing agency (AFC). Written translation and verbal communication time consuming. 	<ul style="list-style-type: none"> AFC / Advisory Board will assist and support deal structure formats. Attractive high-risk opportunities now exist in Ukraine. 	<ul style="list-style-type: none"> Established mechanism for private foreign and domestic investors to become involved in partially funded and or otherwise State- supported initiatives. Format for packaging Ukraine CBM Opportunities

PROJECT: Coal Bed Methane Commercialization

WORK PLAN FROM: October 1, 1998

DATE PREPARED: November 5, 1999

CONTRACTOR/GRANTEE: PIER

TO:

LAST REVISED: N/A

Date(s)	Tasks	Comments
	(a) Identify potential investment opportunities within the context of recognized Ukrainian State Programs; Determine specific pilot development needs (exploration, development, utilization, marketing, etc.) and associated funding shortfalls; negotiate broad terms and assist in the construction and assembly investment opportunity proposals.	AFC designated for implementing "Priority Measures Plan", including a Pilot Drilling and Utilization program within 5 large perspective areas.
	(b) Locate and package potential investment opportunities provided by Ukrainian companies and organizations; negotiate broad terms and assist in the reconstruction and assembly of proposals	Received unsolicited "pre-investment" package on CBM production from coals in West Donbass, Oct 99
	(c) Assist the AFC in the successful implementation of the Global Environmental Facility (GEF) pilot CBM project (Table 2c)	First Draft of PIP completed by EuroGas in early 1999 considered incomplete; 2 nd Draft Completed by VugleGas disqualified as being not representative of the Implementing partner (EuroGas); EuroGas participation ended mid-1999; AFC negotiating with potential new partner for this pilot program.
<p>COMPONENT 3: Concept Development, Facilities Operation, Training, and Self-sustainability</p>		
<p>Objective: Position AFC as Ukraine CBM "focal point" of information and training, having effective managerial and organizational structure oriented toward financial self-sustainability.</p>		
<p><u>Issues/Constraints</u></p> <ul style="list-style-type: none"> AFC Program expansion controlled by outside donor funding support - not by open business market competition. The facility's financial success, i.e. self-sustainability, is not likely possible until such time CBM becomes a recognized profitable industry in Ukraine. 	<p><u>Assumptions</u></p> <ul style="list-style-type: none"> Donor agency supports AFC concepts and objectives, during the period of providing funding requirements for facility operations. AFC Management can obtain necessary funding to continue operating the "business" portion of the facility until CBM is recognized a technically viable resource. 	<p><u>Deliverables</u></p> <ul style="list-style-type: none"> Centralized CBM Investment Center, including a technical, legislative, and regulatory research library, consultation services, and training facilities.

PROJECT: Coal Bed Methane Commercialization

WORK PLAN FROM: October 1, 1998

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TO:

LAST REVISED: N/ A

<ul style="list-style-type: none"> • Apparent "Conflict of roles". It is a fact that the technical viability of producing CBM from the vast major portion of the resource area is not determined. The Ukraine Government recognizes the AFC's role in completing this determination, while donor-funding support recognizes the AFC's role as being primarily involved with investment enhancement issues. • Potential US Government supporting agency - generated competition 	<ul style="list-style-type: none"> • AFC efforts to determine technical viability of producing CBM will be supported by the Ukraine Government, or by Investors willing to accept very large risks. 	
Date(s)	Tasks	Comments
	(a) Build, operate, and promote AFC so to position as "focal point" of CBM – related information and activity in Ukraine	See Table 3a
	(b) Establish Library of Investment – related Information	Processes and significant issues identified and documented (Table 3b); Relevant materials identified, collected, translated, and methods of user access established, and Mechanisms for obtaining / providing updated information developed (Table 3b-1).
	(c) Establish a capable and responsive management and organizational structure	Criteria includes management ability to (1), Create and execute strategic CBM project planning; (2), Attract additional capital; and (3), Develop and manage budget (Table 3c)
	(d) Establish the AFC as a training facility	See Table 3d
	(e) Position Center toward becoming a self-sustaining operation	See Table 3e

ANNEX D - ACCOMPLISHMENTS OF THE AFC

<i>Activities</i>	<i>Description</i>
Development of legislative initiatives Creation of Advisory Board (AB)	<ul style="list-style-type: none"> ➤ AFC Advisory Board develops policy recommendations for the Government of Ukraine on legislative initiatives and regulatory issues related to exploration, development, production and marketing of coal-bed methane, using the AFC as a focal point to attract the investments in order to resolve these issues. Likewise, the Board assists the Government, private and institutional investors in improving the environment for foreign and domestic investment in the Coal-Bed Methane Industry of Ukraine. ➤ AB members signed the Letter of Intent to participate with the AFC Advisory Board on March 16, 1999. ➤ Draft Work Plan for AB was approved as a living document on December 15, 1999.
Advisory Board By-laws	Approved via Advisory Board Protocol # 2 of November 19, 1999.
Designate members (procedures for selection and current membership)	Currently AFC Advisory Board consists of 15 members (11 Ukraine governmental agencies, AFC Director, PIER, US EPA, Supreme Rada of Ukraine).
Training tour (June 19, to July 3, 1999)	Provided the newly created AFC Advisory Board with training in the areas of CBM economics and group organizational building. Training took place in the U.S. at office, field, and classroom locations within the area of Tuscaloosa, Alabama.
Advisory Board Working Procedures	Approved by the Advisory Board Protocol # 1 of September 22, 1999
Work Plans of AFC (Draft)	Draft Work Plan drafted November 1999 (requires updating).
<i>Activities</i>	<i>Description</i>
Implementing regulations for Law on Production Sharing Agreements (for these, need brief description of issue, its importance and what AFC plans to do to address).	<ul style="list-style-type: none"> ➤ Provided review and comments to the Draft Law through SCG (reference available), Law approved September 1999 ➤ Confirm CBM coverage by PSA legislation ➤ Parceling of CBM prospective areas to be covered within PSA / Support

	SCG and MCI in identifying these areas
Inclusion of CBM in Draft Law on Alternative Liquid and Gaseous Fuels	<ul style="list-style-type: none"> ➤ In October 1997 proposed inclusion of CBM within the Draft Law ➤ In September 1999 expanded definition of CBM within the Draft Law ➤ Law passed in January 2000, with expanded definition of CBM included.
Resolution of CMU on CBM Commercial Production from Coal deposits of Donbass	<ul style="list-style-type: none"> ➤ Presents a positive working environment for investors to become directly involved with Government programs (specified in Priority Measures Plan). ➤ Issue 3.1 of AB Work Plan calls for defining opportunities and associated mechanisms, which allow for private investment into specific parts (projects) of this government – approved “Priority Measures Plan”. Prioritize, select, package, and promote these opportunities in order to complete the specific projects that most attract and allow for domestic and/or foreign investment.
Value-added tax	The existing tax burden (VAT @ 20% included) is counter-productive to CBM investment activity because of the relatively high costs of developing and producing the Coal Bed Methane resource, and does not provide sufficient profit incentive to undertake current risks involved in the exploration for and production of coalbed methane (CBM). Advisory Board draft plans requires a detailed study of Ukrainian tax legislation, and development of amendments to be included within laws currently in force or in draft stages which focus on stimulating commercial CBM production. More specifically, the planned work will focus on developing economic justification to support new laws.
Presidential Decree On Hard-to-Recover (H-R), June 7, 1996	<ul style="list-style-type: none"> ➤ Provides for exemption from 1) rental payments for oil and gas produced in excess of the base rates for deposits, determined by CMU as H-R and depleted for the project duration; 2) geological fees for 10 years from the date of obtaining the production license. ➤ State Oil and Gas Committee approved Procedure of Classifying Oil and Gas Reserves as H-R and depleted in July 15, 1996. Issue 6.1 of the AB Work Plan requires completion of the feasibility study justifying CBM as H-R based on low flow capacity and high production costs.
Special permission for use of minerals (Licenses)	Regulations providing the preference for the “continuation” of activity (conversions of exploration to production licenses) shall be given to the previous user (licensee), on the condition that it provides for the “most

	<p>rational use". This is vague and may negate the rights of an exploration license holder to convert to a production license if another company proposes terms that are considered "more favorable". This may discourage investment in exploration. One way to resolve this situation is to issue one License that is renewable, based on specified requirements that consider a two-phased commitment on the part of the investor, i.e. one for exploration, and another for development.</p>
<p>Minerals Code of Ukraine</p>	<p>Questions concerning the right to produce and dispose of Coal Bed Methane and other natural resources produced in connection with Coal Bed methane should be answered with the help of appropriate legislation and regulations. In so doing, CBM should obtain a separate legal status (identification / definition) from Conventional Gas.</p> <p>It is also necessary to more clearly define license coverage, i.e. answer the questions: (1) does a license for conventional natural gas also include the right to produce CBM? (2) Does a license for CBM also includes conventional natural gas confined in strata surrounding the coal seams? And (3) To what extent can the coal mine operator (holder of a license to mine coal) develop and sell CBM within the mine license area?</p> <p>Jurisdictions between Coal Mining and Coal Bed Methane Production Interests, i.e. licensed mine operator versus licensed CBM operator must be clear, and the rights and limitations of coal mine operators involvement in Coal Bed methane well placement, completion, production / sales and abandonment should be defined</p> <p>Legislative avenues through which these issues may be mitigated adjustments and or amendments to the Minerals Code of Ukraine, i.e. the specific listing of minerals of national / local significance; and / or inclusion of Coal Bed methane onto the State Balance, specifically the Instructions on CBM Reserves Assessments, etc.</p>
<p>Land Code</p>	<ul style="list-style-type: none"> ➤ Land Code regulates land relations in Ukraine. ➤ AB Planning Committee #4 is working on adjustments to the Land Code that will provide for eminent domain rights for exploration, production and transportation of natural resources including CBM.
<p>State Committee on Geology</p>	<p>AFC Technical Support Group 1) developed effective, trustworthy relationship at all the levels of SCG with a general focus on licensing 2) Facilitated the Protocol of Intent between SCG and Alabama Oil and Gas Board, delivered to Alabama during training tour of summer 1999.</p>

Gas price structure and production cost	Pricing is a residual of the transport of Russian produced via Ukraine to Western Europe. Government has fixed prices historically which have little bearing on the real market, and costs. Also drilling costs and amortization of well equipment cannot be recovered over a reasonably short amortization period. As a first step in "lobbying" for change, Advisory Board to generate a written report that examine the status and stability of pricing and cost calculations, and present this information in a conference setting.
Create clearinghouse of information on CBM (AFC)	
Secure office space and furnishings (description of what of these AID funds are used for)	<p>The AFC secured the office space on the 4th Floor of the Botanical Institute. The total area is 100.2 m². The premises are divided into four smaller offices and conference area. One office is occupied by Director, one – by Deputy Director and Accountant, one – by Technical Support Director, and the Technical Support Group occupies one. The AID funds were used for the following:</p> <ul style="list-style-type: none"> ➤ Equipment \$33,000.00; ➤ Furniture \$15,000.00; ➤ Renovation (Including Heating/Cooling System) \$29,516.00; ➤ Specialized Software \$46,000.00 ➤ Printing Equipment (transferred to the Coal Ministry, October, 1998) \$83,100.00 <p style="text-align: right;">Total \$ 207,350.00</p>
Create library	The AFC Library is organized as the Access Database consisting of a main table, queries, and forms. The Library files are of four colors. Each color means a category. Blue is "Technical", green is "Legislature", red is "Other", and yellow is "AFC". Grey color means "Subscription". The major part of the library material is available in the both languages e.g. English and Ukrainian or Russian.
Create web page	<p>The AFC Web Site consists of the following pages:</p> <ul style="list-style-type: none"> - About the AFC; - CBM News; - Current Activities; - Business Contacts; - Information Available; - AFC Staff. <p>The web page is updated, as a new material is available.</p>

Produce CBM Journal	The AFC Quarterly is published in English and Ukrainian. The front page is dedicated to the AFC activities and their impact on the CBM development in Ukraine. The second page is devoted to the people effecting the Ukraine CBM industry and the AFC. The third page contains the material on various technical issues relating to CBM. The back page contains news regarding coalbed methane.
Produce documents to assist potential investors and a listing of all such documents completed to date and planned and a few sentences of each.	<ul style="list-style-type: none"> ➤ Coal Bed Methane in Ukraine. Prepared by Burns and Roe Enterprises, Inc, CBM Group in September 1998. Describes Ukraine CBM resource, field activity, commercial-oriented partnerships, government efforts to develop the resource, business, technical and other issues. ➤ Handbook for the formation of a Ukrainian / U.S. joint venture for the production and marketing of CoalBed Methane (CBM). Prepared by International CoalBed Methane Group (ICMG) in September 1998. ➤ Licensing procedure for CBM in Ukraine. Step-by-step Guidebook. 29-September-1998
Provide training and education and a listing of all training conducted to date and planned and a few sentences of each.	<p>One of the AFC tasks is to provide training to Ukrainian CBM specialists. Accomplishing this task, an opportunity to recruit Ukrainian specialists to become future trainers and consultants using the facilities and resources available through the AFC is provided. This concept and approach to training is directly in-line with USAID's intention to position the AFC to become self-sustaining. The following seminars and workshops were conducted within the AID CBM funding:</p> <ul style="list-style-type: none"> ➤ <i>"CBM Resources Evaluation Methods" May 12-14, 1998.</i> 41 CBM specialists from Ukraine and three U.S. consulting firms (Charles M. Boyer II, "Dominion Energy Advisors"; Scott R. Reeves, "Advanced Resources International, Inc."; Gary W. Murrie, "Toccoa Resources LLC") joined for a three-day seminar focusing on gas content measurement, resources determination, and reserve estimation methods. US and Ukrainian CBM gas content methods, methodologies used for CBM in-place resource estimation and differences between them were viewed. ➤ <i>"Coalbed Methane Engineering and Software Application" September 1-3, 1998.</i> The workshop was conducted by Michael D. Zuber, S.A. Holidtch & Associates, Inc. 12 technical experts in mining engineering, programming, and geology were trained on simulating coal reservoir software "COALGAS". In the frames of the workshop CBM engineering methods were also reviewed. ➤ <i>"Regulatory, Coal Mining Safety, and Environmental Issues Involved in CBM Well Development and Operation" September 15-16, 1998.</i> S. Marvin Rogers, Attorney of Alabama State Oil and Gas Board and Brian Luckianov, President of "Environmental Coordinators" performed the presentations on agency jurisdiction and environmental activities. Issues relating to CBM fields establishment, reporting and data collection, cost reducing, and general environmental requirements performed during large-scale CBM projects were emphasized. The representative of Labor Safety Committee made a report on labor safety

	<p>during the exploitation phase of well development. 27 specialists and 3 representatives of US Embassy attended the seminar.</p> <p>➤ <i>“Hydraulic Fracturing in Multi-Seam Coal Reservoirs: Concepts and Practical Considerations” April 19-21, 1999.</i></p> <p>The training course included presentations of general concepts used in hydraulic fracturing, later focusing on the special requirements used to stimulate multiple coal seams. Case studies were provided, leading to group discussion of a site-specific Ukraine (Krasnoarmeysk Field) hydraulic fracture design. The software package, Meyer Fracturing simulators, version 3.0 was installed at the AFC during the last day of the course. 17 CBM specialists attended the training.</p> <p>The above mentioned software, and all hard copy materials including overheads, are available at the AFC for public use.</p> <p><i>English Courses for the AFC Advisory Board and staff started on the January 19, 2000.</i> The program of the courses envisages covering “Beginners Level” for three months. The lessons are conducted by an English native speaker.</p>
Publish papers (summary of papers given – title, event presented at, date)	<ol style="list-style-type: none"> 1. On Licensing Procedures; S.W. Lambert, CBM Specialist, Burns and Roe, Inc. International CBM Seminar, October 1997, Kyiv, Ukraine. 2. Problems and Perspective of Coalbed Methane Industry Development in Ukraine; V.V. Kasianov, Director, Alternative Fuels Center. International Conference “Coalbed Methane in Ukraine”, September 21, 1999, Dnipropetrovsk, Ukraine International Investment Seminar, November 16, 1999, Donetsk, Ukraine 3. The Role of the AFC Advisory Board on CBM Investment in Ukraine; S.W. Lambert, Technical Support Director, Alternative Fuels Center. International Conference “Coalbed Methane in Ukraine”, September 21, 1999, Dnipropetrovsk, Ukraine International Investment Seminar, November 16, 1999, Donetsk, Ukraine 4. Ukraine Opens Door to Coalbed Methane; A.E. Filippov, Environmental Specialist, Alternative Fuels Center International Coalbed Methane Symposium, May 1999, Tuscaloosa, Alabama, USA 5. Current Status of CBM Development in Ukraine; V.V. Lukinov, Alternative Fuels Center International Conference “New Ways of CBM Recovery and Utilization”, February 2000, Oberhausen, Germany
Promote CBM development	The Goal of the AFC is to promote investment and technological development of Ukraine’s Coal Bed Methane Resource. The AFC is focused on developing

	<p>legislation, and has established a mechanism to help accomplish this. In order to help motivate legislators toward reforms, the AFC also plans to facilitate the identification and packaging of possible investment opportunities that are, if possible, in line with Ukraine’s current investment risk environment. These, and all other activities carried out by the AFC have been aimed at positioning this facility as Ukraine’s CBM “focal point” of information and training.</p>
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Annex E - Advisory Board Participants*February 1, 2000*

<i>AB member</i>	<i>Former name of the agency</i>	<i>Current name of the agency</i>
1. Akulov M.O., Chief Geologist on coal	Committee on Geology and Mineral Resources Utilization	Ministry of Ecology and Natural Resources
2. Shchokin A.P., Department Head	State Committee on Energy Conservation	State Committee on Energy Conservation
3.Kovalska N.K., Deputy Head of Dpt on Oil and Gas industry development	Oil, Gas and Refinery Committee	Ministry of Fuel and Energy
4.Kaplanets N.E., Chief Geologist	Ministry of Coal Industry	Ministry of Fuel and Energy
5.Hrebennikova L.K., Head of Dpt on coal industry issues	Ministry of Economy	Ministry of Economy
6.Naumochkina O.A., Deputy Head of Dpt on local taxes and fees and non-tax payments	State Tax Administration	State Tax Administration
7.Gerasimchuk D.A., Head of Dpt on mining issues	Ministry of Labor and Social Policy (Labor Safety)	Ministry of Labor and Social Policy (Labor Safety)
8.Kublanov S.H., Head of Dpt	Ministry of Environmental Protection and Nuclear Safety	Ministry of Ecology and Natural Resources
9.Lakosnyk V.M., Chief specialist	National Agency for Reconstruction and European Integration	Ministry of Economy
10.Kuznyak A.K., Deputy Head of Dpt	Committee on Science and Intellectual Property	Ministry on Education and Science

11. Bulat A.F., Director of the Institute	National Academy of Sciences, Institute of Geo-Technical Mechanics	National Academy of Sciences, Institute of Geo-Technical Mechanics
12. Kasianov V.V.	AFC Director	
13. Stephen Lambert	AFC / PIER	
14. Roger Fernandez (Jerry Triplett)	US EPA CoalBed Methane Outreach Program	
15. Samoilenko Y.I.	Committee on environmental policy issues, natural resources utilization and elimination of the Chernobyl catastrophe consequences, <i>Supreme Rada of Ukraine</i>	

Annex F - By-Laws of the Advisory Board

Regulations

On the Advisory Board

Of the State Enterprise Alternative Fuels Center

1. General Provisions

1.1 Relationship to the Alternative Fuels Center

1.1.1 The Alternative Fuels Center (AFC) is an economically independent juridical entity, founded by the National Academy of Sciences of Ukraine and the Ministry of Coal Industry of Ukraine with a view to concentrating the scientific and technical potential and activity of the above mentioned organizations connected with producing and utilization of the alternative fuels, coal-bed methane in particular, in one entity. It is registered in the State Register of Enterprises and Organizations of Ukraine in Kyiv. The Alternative Fuels Center acts according to its statute, which defines the aim and scope of activity of the company generally as follows:

- Attracting investments (foreign and domestic) in recovery and utilization of the alternative fuels, including coal-bed methane, by means of providing the information about the concrete investment possibilities, projects elaboration and implementation,
- Supplying the technical and legal support and introducing the legal basis facilitating the development of the coal-bed methane industry.

1.1.2 The Advisory Board is created according to the Memorandum of Understanding between USAID, Ministry Of Coal Industry, and National Academy of Sciences of Ukraine, signed April 8, 1999 with the purpose of providing support to the Alternative Fuels Center (AFC) in developing measures aimed at creating favorable conditions for CBM commercial production from coal deposits of Ukraine. The Advisory Board participates in the development and implementation of AFC program activities, and provides specific Government, Support Agency, and Commercial contacts concerning investment – related information. The Advisory Board develops draft laws, policy recommendations for the Government of Ukraine on legislative initiatives and regulatory issues related to exploration, development, production and marketing of coal-bed methane.

1.2 Mission Statement

The Board's mission is to assist the Government, private and institutional investors in improving the environment for foreign and domestic investment in the Coal-Bed Methane Industry of Ukraine.

1.3 Scope of Activity

1.3.1 The Board activities are carried out according to the Constitution of Ukraine, laws of Ukraine, Resolutions of Supreme Rada of Ukraine, decrees and orders by the President of Ukraine, decrees, resolutions and orders by the Cabinet of Ministers of Ukraine, other acts of current legislation and these

Regulations.

- 1.3.2 Through its representatives and within its competence, the Board cooperates with the relevant Committees of Supreme Rada of Ukraine, ministries, bodies of state executive power, enterprises, organizations, foreign and international organizations, private companies and individuals.
- 1.3.3 The Board of the State Enterprise Alternative Fuels Center (AFC) is a standing group, composed of representatives of Supreme Rada, Cabinet of Ministers, bodies of state executive power, other governmental / non-governmental domestic and foreign organizations, enterprises, private commercial companies and individuals (delegating agencies). AFC carries out functions of the executing body to the Board in that it provides organizational facilitation and informational support of Board activities. In accord with the Law of Ukraine "On Enterprises in Ukraine" the Board cannot control or direct AFC financial and business activities.

2. General Tasks and Objectives

- 2.1 Develop recommendations aimed at creating favorable conditions for CBM commercial production from coal deposits of Ukraine.
- 2.2 Create conditions for effective cooperation of the ministries, other bodies of state executive power, domestic, foreign and international organizations, private companies and individuals, in issues of CBM commercial production from coal deposits of Ukraine.
- 2.3 Develop and provide recommendations to the Cabinet of Ministers and bodies of state executive power on legislative and regulatory initiatives.
- 2.4 Facilitate attracting investments and International Technical Assistance to CBM industry development, and to develop recommendations in legislative measures required to attract investments in CBM exploration, assessment and development in Ukraine.
- 2.5 Organize a system of announcements in mass media regarding Advisory Board activities focused on implementing measures aimed at CBM commercial production.
- 2.6 Assist concrete serious coalbed methane investors develop projects in Ukraine.

3. By-Laws

- 3.1 The main purpose of forming the Advisory Board is to respond to the requirements identified in the Memorandum of Understanding between USAID, Coal Ministry, and National Academy of Sciences dtd. April 8, 1998. Membership composition of the Advisory Board can be changed in accord with these Regulations, by-laws of the Board activity.
- 3.2 In its activities the Board follows principles of democracy, publicly open availability ("glasnost"), and mutual respect.
- 3.3 All Board members have equal rights. Each member has the right to submit his (her) own recommendations for the Board consideration, to express his (her) own opinions on the issues that are being considered, is eligible for being elected as a Board Officer (Chairman, Secretary, and so forth).
- 3.4 Board Officer elections are to be held on an annual basis, at an "organizational

- meeting” by open voting, requiring 3/4 of full membership approval. Organizational meetings of the Advisory Board are held annually during the third quarter of each year, starting the year 2000.
- 3.5 The Board Chairman is responsible for convening the Board meetings and supervising over implementation of the Board decisions, coordination of the Board activities with the relevant ministries, bodies of state executive power, institutions and organizations.
- 3.6 The Deputy Chairman carries out functions delegated to him by the Board Chairman, and in case of the Board Chairman’s absence, acts as the Chairman of the Board.
- 3.7 The Board Secretariat provides organizational support of the Board activities, prepares documentation for the Board meetings, and carries out other organizational responsibilities.
- 3.8 More than sixty percent (60%) meeting attendance of membership is considered as official representation, i.e. Quorum attendance.
- 3.9 All voting-related activities require simple majority of membership approval, having at least a quorum representation in attendance.
- 3.10 Every Permanent Board Member has one vote. All other types of Board Membership have no voting authority; i.e. Temporary, Associated and Honorable Members do not have a vote.
- 3.11 A Permanent Member of the Board must introduce new membership. Upon introduction of such membership, the Board considers adding membership as the first issue on the meeting agenda. Candidates must demonstrate a thorough understanding of the Board’s relationship within the AFC; a strong willingness to participate within the context of the Advisory Board Mission Statement and General Tasks and Objectives; and the potential capacity of the candidate to make a strong contribution into the Board activities as a Board member. As a matter of policy, discussion and subsequent voting relating to new membership will take place after the candidate member is excused from the meeting. The decision on approving new membership can be made by not less than ¾ of the Permanent Board membership approval.
- 3.12 Issue of Board membership termination or replacement (upon delegating agency introduction) is considered by the Board following the same procedure (see item 3.11). In the case of Board membership termination delegating agency can officially propose (in writing) a new representative to the Advisory Board for voting consideration. The decision requires not less than ¾ of the Permanent Board membership approval.
- 3.13 Any interested party can be invited to a Board meeting. Decisions on allowing the invited party’s participation in the Board meeting are made upon the permanent Board member’s introduction of the interested party.
- 3.14 In case the Permanent Board Member fails to participate in the Board meetings (for reasons considered to be acceptable to the Board), the Board Member (or the agency that delegated him to the Board) can delegate the Board Member’s rights and responsibilities to his (her) representative. Delegated representation is confirmed with a personal application from the Board Member, or letter from the relevant agency.

- 3.15 The Board meetings are convened according to the approved Work Plan, but not less than once every three months. The Board can have "emergency" meetings. "Emergency" meetings can be convened by the Chairman, Deputy Chairman, Secretary, or by 1/4 of Permanent Board Membership.
- 3.16 The Board Chairman conducts the meetings. In case of his absence, the Deputy Chairman can conduct the meeting. In case of the Chairman and the Deputy Chairman absence, the Board can elect a Temporary Chairman.
- 3.17 The Board activity is based on the annual Work Plan (Perspective Plan) and Quarterly Work Plan, to be approved by the Board. According to the progress of work, changes to the Work Plan are allowed, subject to the Board approval.
- 3.18 All the Board meetings and decisions made are formulated in protocols which are subject to the attending Board Member signature. If necessary, non-attending Board Members may add their signatures, in accord to the Board decision on specific issues requiring 3/4 of full membership approval.
- 3.19 In order to expedite and facilitate consensus agreement, and in strict accordance with the Advisory Board Mission, each Permanent Member of the Board may seek voting majority support on specific issues and activities, through written communication with each and every other Permanent Board Member. Such written communications will be sent to the Secretary of the Advisory Board who, in turn, will distribute such communications, in writing, to each and every Board Member for his/her consideration. Permanent Members will have 10 working days in which to consider and respond to such written communications.
- 3.20 The Board decisions on delegating responsibilities to the Board members are mandatory for the Board members. The Board Member is not responsible for the results of the Board decision implementation if the latter is outside his (her) competence.
- 3.21 If necessary, the Board can provide bodies of the State Executive Power with its own recommendation, drafts of legal-regulatory acts aimed at supporting CBM exploration, assessment and development of commercial production in Ukraine.
- 3.22 Changes to the Advisory Board Regulations are subject to 3/4 of full membership approval.

Annex G - Advisory Board Work Procedures

*Abstract from the Protocol #1
of the Advisory Board meeting of September 22, 1999.*

Work Procedure of the Advisory Board

1. Interested Party Introduces the Issue to the Advisory Board
"Interested party" can be Board member, Government Representative, AFC Director, Funding Agency, any competent individual. Note that an "Issue" must be related to legislation (changes to existing legislation, new draft legislation, necessary feasibility study, legal support, research) that reasonable and logically affects Investment.
2. *Advisory Board considers the issue*
Reject, Clarify, Approve
3. *Advisory Board creates Planning Committee*
The "Planning Committee" is selected from the Board membership and the funding organization (which can be a Board Member, or outside "interested" party / agency
4. *A project plan is defined*
Objective, work description, costs Note that a "plan" is anything that involves new or existing legislation and that can be fully funded by the "interested party / agency" supporting this project. E.g. Hard Tot Recover feasibility study; CBM listing on Minerals Code; a draft of new legislation, or the work necessary to develop or support amendments to existing, supporting documentation
5. *Advisory Board considers the plan*
Reject, Clarify, Approve, and a strategy are defined further advancement of the work product.
6. *Work managed and completed as planned*
7. *Advisory Board advances the Work completed*
As through Inter-agency WG, political Contacts, responsible agencies, or general lobbying efforts

Annex H - Advisory Board Planning Committees

*Abstract from the Protocol #2
of the Advisory Board meeting of November 19, 1999.*

1. **To set up next AB meeting for 17 December 1999.**
2. **Approve Regulations for the Advisory Board (including EPA comments).**
3. **Review the Draft Work Plan and send comments to the Board Secretary. The Secretary shall assemble all the comments into the final Draft before the next AB meeting.**
4. **Create Planning committees on prioritized tasks from the Draft Work Plan:**
 - **Planning Committee # 1**
On PSA enabling legislation (Changes to the List of minerals of local and national importance in the Minerals Code), CBM tax incentives (VAT, Corporate Profit Tax, Geological fees)
Committee members: **Hrebennikova, Akulov, Kaplanets, Triplett, Naumochkina and Gerasimchuk.**
 - **Planning Committee # 2**
On the Draft Law on Alternative Fuels.
Committee members: **Gerasimchuk, Shokin, Kasianov and Triplett.**
 - **Planning Committee # 3**
On CMU Resolution of 6 September 1999 "On CBM Commercial Production in Donbass"(Investment packages for the Pilot Programs) Committee members:
S.Lambert, Kovalska, Kasyanov, Lakosnik, Bulat and Kuznyak.
 - **Planning Committee # 4**
On the Land Code
Committee members: **Akulov, Kaplanets and Stephen W.Lambert.**
5. **Planning committees shall begin to elaborate plans and cost estimates for each project and describe progress on developing these plans before the Board on 17 December 1999.**