Mid-Term Evaluation Report

For

UNDP/GEF Project "Russia – Removing Barriers to Coal Mine Methane Recovery and Utilization"

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February 15, 2007

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Executive Summary

Brief Description of the Project

The project is designed to overcome the barriers that impede the implementation and financing of coal mine methane (CMM) recovery and use projects in Russia; and by doing so, contribute to the reduction of greenhouse gas (GHG) emissions to the atmosphere. The project intends to do this by strengthening the institutional and financial framework for the promotion of CMM projects as well as facilitating the implementation of selected CMM use demonstration projects so as to promote the replication of the technology and methodologies throughout the Kuzbass and Russia. The project calls for the establishing a "Coal Mine Methane Recovery and Utilization Company" (CMMRUC) whose initial focus will be the implementation of demonstration projects at two mines in the Kuzbass, while developing the framework to become self-sustaining upon project completion. One project consists of fueling a boiler with CMM to generate heat for technological needs in coal mining or greenhouses in which vegetables will be grown, and the second project will use CMM to fuel an internal combustion engine to generate electricity.

Context and Purpose of the Evaluation

This evaluation is intended to assess progress in each of the project components and to offer recommendations as guidance for future action. Difficulties in project implementation have been identified, along with their causes; and recommended courses of action are made to correct the difficulties.

Several key tasks have been identified as crucial to the evaluation and assessment of the project; they are:

- Assessing the overall performance of the project against the five objectives set out in the Project Document and listed above;
- Assessing the effectiveness and efficiency of the Project;
- Critically analyzing the plans for implementation and management of the Project;
- List and document initial lessons concerning Project design, implementation, and management;
- Assess Project outcomes to data and review strategies and plans for achieving the overall objectives of the Project within the project timeframe;
- Assess Project relevance to national priorities;
- Provide guidance for the future Project activities; and
- Provide general guidance for any future CMM project activities.

Main Conclusions, Recommendations and Lessons Learned

There are five major components of the Project, as defined by the Project Document; the key components being the demonstration of coal mine methane recovery and use technology via implementation of a pilot project, and the establishment of the CMMRUC. With the delay of these two components, and with all the other outcomes tied to their progress; the entire Project is seriously behind schedule.

The formation of CMMRUC was designed to be the vehicle through which all other components of the Project would be executed. The key reasons that have been cited for project delays include:

- Lack of initial commitment to a project by Kuzbass mines.
- Difficulty in developing a Project Team that could implement such a project.
- Difficulty in stakeholders agreeing on technology to demonstrate.

Key to the Project's success is the formation of CMMRUC. After a comprehensive analysis of various options, Uglemetan – a project implementing agency in Kemerovo – is primed to assume this role so efforts should be made to cause this to happen as soon as possible. Doing so will allow implementation of the demonstration project, documentation of lessons learned, and sharing the experience with project stakeholders. The simplest and most expedient solution would be to reposition Uglemetan into a newly formed CMMRUC company and begin operating immediately.

With regard to the demo project component, efforts should be redirected to implement only one project at this time; the Komsomolets Mine project. CMM will fuel a boiler to supply waste heat to greenhouses in order to grow vegetables for sale in the Kuzbass region. A small IC engine power generation system should be installed so that both facets of the projects as they were previously planned can be demonstrated. The second project can be implemented after the first, incorporating the lessons learned from the first and replicating it successes. Along with the new implementation plan, all organizations that are involved with this project should be recognized and empowered as stakeholders, including the design company and equipment and service providers. Since these organizations and entities stand to benefit economically from successful implementation, their active involvement will help to ensure that the project can be replicated in the Kuzbass.

All available tools should be used to disseminate Project progress, including web-based newsletters and electronic progress reports. State-of-the-art software should be used for project management and cost tracking; and the results of the tracking should be made available (as appropriate) to the stakeholders.

In order to accomplish these tasks, the project finish date must be extended to allow for completion of the first demonstration project and dissemination of results. Now is the appropriate time to reconfigure the project plans so that one project is fully implemented before the second is initiated.

The most important lesson to take away from this project to date is that the original program element calling for first establishing the CMMRUC should have been adhered to. The formation of this company is the critical path to project success. Most of the subsequent issues, causing further delays, could have been avoided had CMMRUC been operating as project developer.

Introduction

Project Background

Project Description

The goal of this project is to remove the barriers that impede the implementation and financing of coal mine methane (CMM) recovery and use projects in Russia; and by doing so, contribute to the reduction of methane emissions to the atmosphere, a greenhouse gas (GHG) which is more than 20 times as potent as carbon dioxide in the atmosphere. The project intends to do this by strengthening the institutional and financial framework for the promotion of CMM projects as well as facilitating the implementation of selected demonstration CMM use projects so as to promote the replication of the technology and methodologies throughout the Kuznetsk Basin (Kuzbass) and Russia. To help initiate this, the project also calls for the establishment of a "Coal Mine Methane Recovery and Utilization Company" (CMMRUC) whose initial focus will be the implementation of the demonstration project in the Kuzbass, while developing the framework to become self-sustaining upon project completion.

Two demonstration projects have been proposed at coal mines in the Kuzbass, the Komsomolets Mine and the Kirova Mine, both of which are owned by SUEK. The project proposed at the Komsomolets Mine consists of fueling a boiler with CMM to generate heat for greenhouses. At the Kirova Mine, the CMM will be used to fuel an internal combustion engine to generate electricity.

Kuznetsk Basin Summary

Explosions and fires due to hazardous concentrations of methane in Kuzbass mines have caused many fatalities throughout the history of mining in the Kuzbass. Because ventilation alone is not always sufficient to remove methane from gassy coal mines, more than half of active Kuzbass mines employ methane drainage systems in addition to ventilation. These mines drain more than 120 million cubic meters of methane annually that could potentially be used as fuel, but instead is emitted to the atmosphere. This methane is both a wasted energy source and a potent greenhouse gas.

While Russia is currently the world's 4th largest emitter of CMM, these emissions are expected to decrease over time. CMM emission abatement potential at Russian mines directly depends on the efficiency of degasification systems, and upon mining, geological, and reservoir conditions. While Russian mines and mining associations welcome developments leading to the reduction of methane content of mined coal seams, they often lack institutional and technical support to initiate CMM abatement projects. Unlike other gassy coal basins of the CIS, Pechora, Donetsk, and Karaganda, coal mine methane (CMM) utilization is not a common practice in the Kuzbass. One reason for this is the low concentration of methane in the gas produced by current drainage practices. It is not uncommon for the concentration of the drained gas to be dangerously low, ranging into the explosive levels (15 to 25%).

Fifteen mines are responsible for more than 90% of the methane drained in the Kuzbass. These mines may represent the best targets for methane utilization projects, since they already have drainage systems in place. At most of these mines, significantly more methane could be drained by implementing improvements in drainage technology and monitoring practices, as indicated by the large quantities of methane liberated at each mine. The Kuzbass also has many gassy mines that do not drain methane. If methane drainage systems were installed at those mines, significant amounts of wasted methane could be recovered.

Project Goals

In order to develop a market for and initiate the implementation of commercially feasible CMM projects in Russia, five key goals must be met:

1. Establish and capitalize the CMMRUC and ensuring its sustainable operation;
2. Raise public awareness and capacity building through training programs at the mines;
3. Implement selected demonstration projects;
4. Review and recommend warranted changes to the existing legal and regulatory framework; and
5. Monitor, evaluate and disseminate the project results and lessons learnt in order to replicate the successes enjoyed while avoiding future missteps.

Purpose of Mid-Term Evaluation

The mid-term evaluation is intended to assess progress in each of the project components, as described above; and to offer recommendations as guidance for future action. Any difficulties in project implementation are to be identified, along with their causes; and recommended courses of action are made to correct the difficulties.

Several key tasks have been identified in order to accomplish this evaluation. They are:

- Assess overall performance of the project against the five objectives set out in the Project Document and listed above;
- Assess the effectiveness and efficiency of the Project;
- Critically analyze the implementation and management arrangements of the Project;
- List and document initial lessons concerning Project design, implementation, and management;
- Assess Project outcomes to data and review planned strategies and plans for achieving the overall objectives of the Project within the project timeframe;
- Assess Project relevance to national priorities;
- Provide guidance for the future Project activities; and
- Provide guidance for any future CMM project activities.

Key Issues Addressed

The focus of this evaluation is to assess the progress made for each of the components of the Project. If the goals of each component are met, then the overarching goal of the project, successfully demonstrating a coal mine methane project in Kuzbass is technically and economically feasible is met; thus, the progress for each task would contribute to the overall progress of the Project.

Evaluation Outputs

It is the goal of the mid-term evaluation that any observations and recommendations suggested in this report be considered by the Project Team. The progress of the Project is behind schedule for reasons that have been previously identified and documented by both the Project Team in their July 2005 and 2006 annual reports, and other evaluator's reports (Olexandr Pysarenko and Marina Olshanskaya). This report presents an update of the progress, discusses the issues that have led to the delays in progress, and assesses a plan of action that the Project Team has proposed to ensure the project's success.

Methodology of the Evaluation

Prior to traveling to Russia, many of the available documents pertaining to the project were reviewed and telephone discussions were conducted with the Irina Bredneva, the UNDP Project

Coordinator and Dr. Oleg Tailakov, the Project Manager on separate occasions to discuss the Project and any additional needs.

A site visit occurred from 12 – 21 October, 2006 to Moscow and Kemerovo; and meetings and discussions were held with many of the stakeholders of the Project, including:

- UNDP/Moscow – Elena Armand, Head of Environmental Unit and Irina Bredneva, Programme Associate
- Vladimir Berdin – Project Deputy Manager, Consultant to UNDP representing Ministry of Economic Development and Trade
- Ministry of Economic Development and Trade – Oleg Pluzhnikov, Head of Division of Economics for Environmental Protection, Project National Director
- Alexander A. Averchenkov – external consultant to the Project
- Uglemetan – Dr. Oleg Tailakov, Project Manager, and staff of Uglemetan
- Komsomolets Mine – Vasily Kisilev, Chief Engineer
- Kemerovo Regional Administration – Dmitry Islamov, Chief of Program and Investment Policy Board
- UNDP/Bratislava – Vladimir Litvak, Regional Technical Advisor, and Irina Bredneva.

The regional representative of SUEK, Vladimir Klimov, and a SUEK corporate (Moscow) representative, were both not available for meetings.

Additional reports were provided by the UNDP Moscow office after returning to the United States, including both Pysarenko and Olshanskaya's evaluation reports, as well as the CMMRUC Business Plan.

The overall progress of the Project was measured against the milestones described in the project document, and has been modified as appropriate to accomplish the goals of the Project.

Structure of the Evaluation

The format of this report follows the suggested format in Annex 1 of the **Terms of Reference** for the Mid-term Evaluation of the UNDP/GEF Project.

The Project and its Development Context

Project and its duration

The project was initiated in August of 2003 and is scheduled to last for 48 months, with a scheduled finish date of October 2007.

Implementation Status

The first tasks to be initiated on behalf of the Project were carried out in August of 2003; and work has been ongoing on the Project since that time. It is clear that some of the barriers that could impede progress were underestimated; specifically, the barriers associated with lack of incentives to interest coal companies to participate in the project, as well as those associated with creating and capitalizing CMMRUC.

Problems that the Project Seeks to Address

The Scope of Work of the Project has identified several barriers to the development of coal mine methane projects in the Kuzbass. The goal of the Project is to demonstrate ways of overcoming these barriers in order to allow the commercial development of coal mine methane recovery and use projects, initially in the Kuzbass, but ultimately throughout the CIS countries. These barriers include:

Lack of Practical Experience: Institutional and technical barriers exist related to the fact that coal mines in the Kuzbass do not have sufficient experience in developing or implementing coal mine methane recovery and use projects. Most mines have no experience in working with external funding sources or hiring technical service companies to help facilitate such projects; moreover, they may not see the advantage of doing so.

Lack of Technical Support: The coal mines typically do not have the time or the technical resources to put towards new initiatives that are not directly related to their core business, which is mining coal. Local experts that have theoretical knowledge related to methane recovery and use do exist, but very few have substantial practical experience.

Lack of the Ability to Secure Financing: Methane liberation associated with mining is still primarily considered a safety hazard, and not yet looked upon as a potential energy source. For this reason, most of their efforts, both financially and technically, are focused on degasification for purposes of safe mining; not for developing a profitable adjunct business. The efficiency and effectiveness of technologies currently employed are not conducive to methane recovery and use. Coal mine owners and management are reluctant to direct financial resources towards recovery and use projects until the point in time at which they can better understand and appreciate the beneficial economic impact that methane recovery and use can have on coal production and safety.

Lack of Equipment and Knowledge with Regard to the Measurement, Monitoring, Reporting, and Verification of GHG Emissions Reductions: The mines have no experience in the conceptual and practical issues related to creating emission reductions and accessing GHG markets; therefore, they are unable to assess the potential benefits of certain aspects of implementing projects that involve emissions reductions.

Immediate and Development Objectives of the Project

The overall objective of the Project is to create a viable market for the development of coal mine methane recovery and use projects, through implementation of a demonstration project that can be easily replicated not only in the Kuzbass, but other gassy coal mines in CIS countries.

In order to achieve this goal, the Project is designed to:

- Raise coal mining company management's awareness of the advantages of, and possibilities for, improving mine degasification and methane utilization techniques and technologies;
- Establish the CMMRUC to support coal mines in key aspects of project development and implementation;
- Implement selected coal mine methane recovery and use demonstration projects so as to gain experience for wide scale replication, while demonstrating the project's feasibility to key stakeholders;
- Build capacity of mine personnel as well as other relevant stakeholders through training and experience in order to facilitate implementation and acceptance of new technologies;
- Review the existing legal and regulatory structure and make recommendations for its improvement so as to increase the potential for sustainable development of coal mine methane recovery and use projects; and
- Build local capacity for monitoring, reporting, and verification of resultant GHG reductions achieved.

Main Stakeholders

A Project Steering Committee has been established to provide overall guidance and support to Project implementation and to ensure coordination of the Project with other coal mine methane initiatives within Russia. The committee comprises representatives from key stakeholders of the Project, including:

Government

- Oleg Pluzhnikov – representing the Ministry of Economic Development and Trade
- Elena Armand – representing UNDP
- Igor Korobecki – representing the Kemerovo Regional Administration
- SUEK – represented by Vladimir Klimov in Leninsk-Kuznetsk
- Komsomolets Mine – represented by Vasily Kisilev, Chief Engineer
- Kirova Mine – represented by Yuri Ivanov, Chief Engineer

As the demonstration projects unfold, other organizations, such as equipment suppliers and design organizations may express interest in becoming project stakeholders. However, at this time, there are no representatives from these organizations involved as either stakeholders or as members of the Project Steering Committee.

Results Expected

The overarching goal of this project is to create a viable market for and initiate the development of commercially feasible coal mine methane recovery and use projects. In accomplishing this goal, additional benefits would accrue include:

- Reduction of local pollution by substituting CMM and decreasing the use of low grade coal as fuel in systems which do not have sufficient emissions controls;
- Improve safety and productivity of the mines;
- Create new employment opportunities by creating a new industry; and
- Improve energy security.

A Project Planning Matrix was developed and included as an annex (Annex 2) of the Project Document, which describes the goals of the Project as well as the indicators by which success of each goal will be measured. At this point in the project, many of the indicators have not yet been achieved, thus using the matrix to chart Project progress would not be very effective.

Findings and Conclusions

Project Delivery

Current status of the project development

The original objective, as described in the Project Document, was to establish the CMMRUC; and then all other activities carried out under the Project would be coordinated by the company. It became apparent only after the Project began, that the structure of CMMRUC could take many forms, including a noncommercial partnership, a not-for-profit organization, or a joint-stock company. The primary issue related to the structure of company was how the revenues and profits would be distributed to the stakeholders and/or shareholders. The project's key stakeholders are only now coming to some resolution as to what the structure of the company should be. Other issues under discussion include where the company should be headquartered, the ownership structure, and the overall business model of the company. Considering the importance of these issues, a consensus has still not been reached and outward support from some the stakeholders to resolve these issues are not apparent. Moreover, major stakeholders, including those representing private sector, are still reluctant to play an active role in establishing CMMRUC and to share the risks associated with its operations.

The main activities to be implemented under the project demonstration component, as described in the UNDP/GEF Project Document, are:

- Finalizing the detailed technical, economic, and financial design of demonstration projects;
- Technical, economic, environmental and legal assessment of the selected demonstration projects;

- Finalizing detailed contractual and financial arrangements for selected demonstration projects; and,
- Successful implementation of the demonstration projects.

The decision to focus on converting boilers to burn gas to generate heat for use in a greenhouse for growing vegetables at the Komsomolets Mine (rather than using the heat to generate electricity) was eventually made for a number of reasons:

- There are a large number of boilers in the Kuzbass that could be retrofitted, aside from just boilers located at mines;
- There is no market for power generated by CMM; it cannot compete with current electricity prices in the region;
- A project such as this would require services that the CMMRUC could continue to offer as a service (capacity building); and
- Development of new companies offering needed equipment and/or services to support CMM utilization projects.

The delay in finalization of this decision was, in part, the cause for some of the delays in Project progress.

Progress of the project as a whole in achieving its stated objectives

In short the entire Project is significantly behind schedule. The CMMRUC has not been formed and implementation of the demonstration project is behind schedule. Reasons for the lag in progress have been thoroughly documented in many of the earlier reports, including the latest progress report submitted by the Project Team, as well as the two evaluation reports submitted earlier by Mr. Pysarenko and Ms. Olshanskaya. The reasons for project delay are:

- Lack of initial commitment to a project by Kuzbass mines.
- Difficulty in developing a project development team that could implement such a project .
- Difficulty in stakeholders agreeing on technology to demonstrate.
- Adapting project goals to changing business environment in Russia.

These reasons will be discussed in greater detail in the sections following.

Effectiveness, efficiency and timeliness of project implementation

While work on all components of the Project has been initiated, implementation of the project is behind schedule relative to all five objectives. This is due mainly to the fact that the overall progress of the Project is dependent on first, establishing CMMRUC; and second, initiating the coal mine methane recovery and use demonstration project. It is only possible to promote coal mine methane recovery and use projects, work on strengthening the legal and regulatory framework, and to disseminate the results, once the demonstration projects have been established and operating. At this time, no substantial progress has been made on these components of the Project.

Stakeholder participation, partnerships

Many of the delays that have hindered the progress can be attributed directly to stakeholder participation; or more directly, either the lack of participation or obstructive behavior.

The following is a summary of the key issues listed above all of which account for Project delays and all involve stakeholder participation:

- ***Lack of initial commitment from Kuzbass mines to commit to project.*** This issue is derived in part from the lack of understanding of what is entailed in developing coal mine methane recovery and use projects, and what might be required of the host mines. Regardless of need, Kuzbass mining companies seem unwilling to commit funds to the

project. This lack of understanding is due largely to the fact that while coal mine methane utilization is common in most other gassy coal basins in Europe as well as elsewhere in Russia, no projects currently exist in the Kuzbass and presently, there are no incentives to do so. As with most coal mine managers in the world, managers in the Kuzbass are focused in producing as much coal as possible for sale. Many managers perceive involvement in demonstration of technology that they do not understand as an unnecessary complication to their pursuit of production goals. It is clear that a mine (or mining company) must become a champion for this project. As a high profile stakeholder, a mine would benefit from the demonstration of the technology, share in the revenue stream, and the safety benefits.

The Kuzbass is an extremely gassy coal basin where gas utilization is not currently practiced. Paradoxically, while the situation in the Kuzbass lends itself to becoming the perfect candidate for implementing such a Project, the situation presents just as many challenges. Only if these challenges can be viewed from a coal mine managers' perspective, will the relevant solutions to overcome the barriers become apparent. The solutions must incorporate a practical and tangible benefit that increases coal mining productivity.

Difficulty in developing a project development team that could implement such a project. The first company chosen to develop the methane drainage and utilization equipment was a Ukrainian company based in Donetsk, Ukraine. After every indication that the company would be willing to work on the Project, it was only after a trip to visit the company's management and several rounds of negotiations did negotiations fail.

The Ukrainian company was originally chosen for the following reasons:

- The company has converted more then 20 boilers of the same type as is installed in the boiler station on Komsomolets Mine;
- The company agreed to provide its service for less money then Russian companies;
- A company with equivalent experience does not exist in Russia.

However, the Ukrainian government interceded ordering the cancellation of all contracts that this Ukrainian company had with Russian partners, especially those where the transfer of technology was concerned.

This forced the Project Team to look elsewhere for a company with expertise in methane drainage design and implementation. A company located in Novosibirsk, Novosibirskteploenergoproect (NOTEP), was subsequently chosen to design the project at the Komsomolets Mine.

- ***Difficulty in stakeholders agreeing on technology to demonstrate.*** The original scope of work called for the coal mine methane to be used for power generation; however after considering the large capital expenditures required for power generation, the Project Team ultimately opted for constructing new modular boilers that would be fueled by coal mine methane. This decision was made, instead of retrofitting the mine's existing boilers for these following reasons:
    - Work would be totally independent of mining;
    - Retrofitting existing boiler houses would be problematic;
    - Issues related to ownership, production interruptions; and
    - Difficulty in quantifying savings, or understanding and documenting revenues to the mine.

While these reasons are sound, the time it took to come to the realization was overly long.

- ***Delayed decision on end-use technology.*** Only after these other issues were resolved (for reasons discussed previously) was the decision made to utilize the heat generated by the boilers in a greenhouse in order to grow vegetables that are rarely available in the Kuzbass in the winter.

There was still dissention among stakeholders and hired consultants as to how the purchase of the greenhouse should be treated. If this issue remains unresolved, it needs to be resolved immediately. Further complicating the matter: the GEF Project Document calls for capitalizing CMMRUC, but as this has not happened, therefore CMMRUC cannot purchase the greenhouse.

Even if resolution is reached at this juncture, all potential issues that could arise will not have been considered as not all of the stakeholders that were involved when the project started are still involved in the project. Moreover, some companies and organizations that are now involved in the project were not considered as stakeholders when the Project was conceived. Examples of this are NOTEP, the Novosibirsk design institute, and Sovhoz Sukhovsky (greenhouse manufacturer). The stakeholders involved in decision making needs to correlate to and include the groups that will actually be involved in project management and implementation, and ultimately, project success.

Project Implementation

Project Oversight

The Project Steering Committee, a five-member committee representing key industry and government organizations, is not totally engaged in Project oversight. Project oversight is currently the responsibility of Oleg Tailakov, Director of Uglemetan and GEF Project Manager, while Irina Bredneva, on behalf of UNDP, has offered insight and guidance. Both have a thorough understanding of the overall goals of the project and have continued to identify ways of overcoming any and all obstacles that have been encountered. According to the Project Document, key strategic issues are decided by the Steering Committee, either during annual workplan discussions, or ad hoc, as appropriate. All other stakeholders are to be kept abreast of progress via monthly reports. If a stakeholder's direct involvement is required, special meetings are held with all directly involved parties. These types of meetings should become more frequent as the demonstration project is carried out; specifically including representatives of the methane drainage design company (PROTEP), SUEK, the Kirova and Komsomolets mines, and the manufacturers of the greenhouse.

Project Execution

Uglemetan, a private not-for-profit service company located in the Kuzbass, has been appointed by the project executing agency (METT) as a local implementing agent, and has been acting on behalf of the Project to carry out its goals until the CMMRUC is established. Oleg Tailakov, the National Project Manager, is also the director of Uglemetan, and much of the past experience and current work being carried out by Uglemetan is congruent with that envisioned for the CMMRUC. Uglemetan, with its experience, knowledge, staff and other assets, is the most obvious choice to be able to fulfill the duties of those planned for the CMMRUC. Uglemetan and its financial and institutional supporters have believed from the beginning that the company would assume the role of the CMMRUC as the GEF project was carried out. However, at present, all stakeholders are not fully supportive of Oleg Tailakov leading the CMMRUC nor having Kemerovo become headquarters for the company.

Uglemetan, since its inception in 2004, has been slowly developing a strong clientele of Russian coal mines and affiliated industries as well as project developers (domestic and foreign), while developing an arsenal of services and products necessary for growth in coal mine methane recovery and use; not only in the Kuzbass, but in other coal basins of the CIS. Dr. Tailakov is considered by the international coalbed and coal mine methane industry to be an expert in the field. Dr. Tailakov and Uglemetan, however, do lack capacity building skills associated with operating a profit-oriented business. This will be addressed in one of the components of the Project.

The structure of CMMRUC, as laid out in the Project Document, is different than the current structure of Uglemetan. Dr. Tailakov currently has total control over the direction of Uglemetan; which will not be the case should he be appointed director of the CMMRUC. If this transpires, Tailakov will be required to take direction from a Board of Directors, and quite possibly be required to change or evolve his management style. These facts are known to Dr. Tailakov, and he continues to work towards positioning himself and his company towards assuming the role of CMMRUC.

Until the CMMRUC is formed and the company assumes the lead in project implementation, there is no cognizant authority to execute the project.

Project Implementation

The key steps to project implementation are the forming of the CMMRUC and the execution of the demonstration projects. Neither of these Project components has been achieved yet.

Meanwhile, project designs have been finalized for both demonstration projects (Komsomolets Mine and Kirova Mine) and submitted to authorities for approval. All contractors have been identified and procurement procedures have been initiated. Upon receipt of approval from the authorities, detailed schedules are in place for implementation for actual implementation of the projects. However, as mentioned several times, only once the CMMRUC is established can construction begin on either of these projects. Demonstration project implementation is the key to the success of the overall project. There will be no successes until this happens.

Other key components to the success of the project can only be implemented once the CMMRUC is formed and the demonstration project(s) are operating. To facilitate the future task of disseminating project results, the Project Team has begun to disseminate information on technical aspects of coal mine methane recovery and use that apply to the Kuzbass; and via a two-day workshop that the Project Team sponsored this past June in Kemerovo, they introduced the many financing mechanisms that are available to fund such projects.

Russia has ratified the Kyoto Protocol which opens the doors to additional sources of project funding under Kyoto mechanisms and other carbon financing schemes. A National Action Plan on Joint Implementation has been initiated and an inter-ministerial Commission on Climate Change has been established. Draft procedures for implementing projects under Kyoto have been developed separately by several ministries, but at this time each draft is slightly different and there is no indication that a resolution will be anytime soon. These factors impact the economic and commercial relevancy of the proposed projects, and further accrue to reasons that Uglemetan is well positioned to take over the role as CMMRUC.

Other tasks that the Project Team have carried out recently that will aid in facilitating disseminating project results and raise public awareness and capacity building through training programs include:

- Developing skills that will be invaluable as carbon financing schemes advance; including the preparation of several Project Information Notes (PINs) and at least one Project Design Document (PDD).

- Updating Uglemetan's web-site (www.uglemetan.ru) to present the many different types of projects the company has been involved which are allied with the goals of the Project.

- Introducing potential project developers to CMM project opportunities in the Kuzbass. Several international development companies have begun to investigate potential project opportunities available under Russia's carbon financing mechanisms, once an executing agency has been formed and is operating. These companies include:

- Marubeni Corp. Moscow
- Green Gas International
- Mitsui & Co. Moscow
- MGM International

All of these companies have been in contact with Uglemetan and most-likely will rely on their expertise and connections if they move forward.

- Hosting workshops and seminars focusing on the mining industry, particularly coal mine methane. Key to disseminating information thus far was the organization and execution of the June 2006 Workshop, "Coal Mine Methane: Recovery, Utilization, Investment Opportunities," held in Kemerovo.

- There are also opportunities to work in concert with USEPA's Coalbed Methane Outreach Program (CMOP) in the Methane to Markets outreach effort. This effort includes identification and contact with mines that indicate a need for assistance in evaluating the potential benefits of employing different technologies to increase gas drainage efficiency and use.

The Project Team should take full advantage of all opportunities to promote the goals (and results) of the Project.

Project administration

The Project Document originally called for the formation of the CMMRUC first; and then from this, all other activities carried out on behalf of the Project would be done so by the CMMRUC. Thus, it is safe to say that the Project would be administered by the CMMRUC, operating with input and support from the Project Stakeholders, administered through the steering committee.

One key component of creating the CMMRUC is the development and consensual acceptance of a Business Plan by all stakeholders. A draft Business Plan (Annex 5), developed by Uglemetan, has been distributed among key stakeholders, and comments from several have been received and are being addressed by Uglemetan staff. Within the Business Plan are several Gantt Charts depicting the revised schedules for implementation of both demonstration projects (Figures 1 & 2). These were modified in November to reflect the thinking at that time regarding project start-up. Again, there are delays in start-up and these schedules will have to again be adjusted. A column has been added to each table indicating whether each stage has been implemented. No purpose is served if effort is put into developing and modifying schedules if they are not adhered to.

Figure 1: Time Schedule for Project Realization at Komsomolets Mine

Project Realization Plan						
Stages	Sept. 2006	Oct. 2006	Nov 2006	Dec 2006	Jan 2007	Implemented
Designing CMM utilization system for a boiler station						Yes
Equipment acquisition, including a modular boiler station						No
Assembly work for a modular boiler station, gas pipeline, equipment						No
Greenhouse manufacturing and assembly						Yes ?
Licensing and certification						No
Personnel training						No
Reaching estimated capacity						No

Figure 2: Time Schedule for Project Realization at Kirova Mine

Project Realization Plan					
Stages	2006 3 qtr.	2006 4 qtr.	2007 1 qtr.	2007 2 qtr.	Implemented
Designing vacuum pump station and CMM utilization system					Yes
Production Project approval					Yes
Selecting equipment supplier, tender announcement					Yes
"Ozernaya" substation and transmission facilities construction					No
Equipment acquisition, including gas generator units					No
Assembly work for equipment and a gas generator station					No
Surface construction –assembly works					No
Unified system construction comprising a vacuum – pump station, electrical power sub station and a gas generator station.					No
Licensing and certification					No
Personnel training					No
Reaching estimated capacity					No

Project Planning

The Project Team has made the decision to postpone the formation of CMMRUC and focus efforts on implementation of the demonstration project.

Meanwhile, Uglemetan is acting as the Project Team to carry out the objectives of the Project because the company has not yet been established. Having said this, Dr. Oleg Tailakov and the

staff of Uglemetan have done a thorough job of tracking and reporting on progress in all components of the project.

The final Demonstration Project Design documents for both demonstration projects have been completed and submitted to the proper regulatory authorities for review and approval. Once feedback is received from the authorities, an analysis of current regulations and necessary changes to promote project development will be carried out. The primary regulatory entity is *Rostechnadzor, Mine Safety Inspection*; however, other agencies will also be petitioned for their input. These agencies include:

- VOSTNii – Industrial and Technical Safety authorities
- Russian Ministry for Emergency Situations – Kemerovo Department
- Fire Safety authorities
- Environmental safety authorities

The latest timeline developed by Uglemetan forecasted project implementation would commence during the fourth quarter of 2007 (Figures 1 & 2). Implementation is behind this revised schedule, and during the 2006-2007 winter in the Kuzbass, further delays are likely. It is clear that because the CMMRUC has not yet been formed, the progress of the demonstration project has been slowed. For a company such as Uglemetan or a nascent CMMRUC, implementation of a project of this magnitude typically requires undivided attention; without full support of all interested parties, delays can be expected.

Once the CMMRUC has been established and the demonstration project has been implemented, then focus can be placed on the other components of the Project. At this time, work on these components has been delayed.

Monitoring and evaluation

One of the key components of this Project is *monitoring, evaluating, and disseminating the project results and lessons learnt.*

The four key outputs attributed to this component are:

1. Establish a system to monitor and verify the GHG reductions resulting from project implementation.
2. Disseminate Project reports; mid-term and final.
3. Disseminate the Project results through public media, and as applicable, by organizing additional seminars and workshops.
4. Facilitate the replication of CMM projects in the Kuzbass as well as other gassy basins in CIS countries.

In support of this, the Project Team has developed a page on Uglemetan's web-site that summarizes each month's activities carried out on behalf of the UNDP/GEF Project. Also listed on the site are summaries of each of the projects being implemented as well as other news pertinent to the Project. As was discussed earlier, this page is months behind in reporting Project activities.

Again, because the demonstration projects have not yet been implemented, there is relatively little information to monitor and evaluate, let alone disseminate.

Risk management

There are numerous risks associated with this project, from the more conventional types of risks that are associated with project development in Russia, to those specific to this project. A brief discussion of each of these types of risk follows:

Institutional Risk
There is risk associated with the Russian government actually establishing the mechanisms necessary to facilitate the various carbon finance mechanisms to promote CMM project development. One component of this Project is to recommend changes to the existing legal and regulatory framework, but as of yet, little work has been done to this end. An Action Plan should be developed as to how the Project Team will carry out this task.

In addition, Russia currently has no legislation in place to promote coal mine methane utilization project development. On the other hand, within the last few years, safety requirements for gas facility construction and operation have became much stricter. To reduce this risk the project team has hired well-known Novosibirsk design organization NOTEP, experienced in the design and certification of the unconventional technical projects, including nuclear, natural gas, and clean coal power stations.

Management Risk
Mentioned previously is the uncertainty surrounding Dr. Tailakov's willingness to conform to a different management style as he becomes Director of CMMRUC. One suggestion for minimizing this risk is to make Dr. Tailakov a member of the board of the CMMRUC so that he does have a say in all board decisions. Further to this issue is the risk associated with the ability of CMMRUC to become self sustaining after completion of this Project. The fact that one of the stakeholders in the Project is SUEK, a large corporation that controls numerous gassy mines in the Kuzbass will enable CMMRUC to continue cooperation with SUEK-mines pending success of the demonstration project and willingness on the part of both parties.

Effective outreach and reporting of successful project results will minimize the risk surrounding a coal mines' lack of willingness for future participation in emission reduction projects. Presenting the benefits and risks in such a way that is easily understood by mine management can minimize these risks. Two out of the five Project components are directed at this risk:

- Public awareness raising and training; and
- Monitoring, evaluating, and disseminating the project results and lessons learnt.

Financial Risk
There is risk associated with the continued financial stability of CMMRUC, which can again be ameliorated by effective outreach of project results and marketing to coal mines and their parent companies.

Technical Risk
Another risk common to projects such as these are technical risks. With respect to the project at the Komsomolets mine, will the mine be able to supply sufficient gas to meet the boiler's requirements, and moreover, will the boiler work as designed to supply heat to the greenhouse? At the Kirova Mine, will the mine be able to supply sufficient gas to meet the electricity generator's requirements? Establishing proper training programs at the mines can minimize these risks. Building awareness as well as technical and managerial capacity in the region's coal mine industry are key components of the Project and should be an overarching goal of UNDP's strategic plans. The willingness of the mines to work with the project developers to meet fuel demands will be essential to the success of developing this industry in the Kuzbass, and eventually, elsewhere. Also, coal industry officials and mines operators view methane as a safety hazard and an obstacle towards increasing coal production, rather than a valuable energy resource. The coal mines and coal companies are often willing to invest in improved degasification, but are reluctant to self-finance and operate methane utilization facilities. One of the major project goals is to increase awareness among coal mine personnel about potential economic benefits of CMM recovery and utilization. Uglemetan recently sponsored a workshop in the Kuzbass which allowed coal mines owners and management personnel to learn more about advanced CMM utilization options and about new financial opportunities via Carbon financing.

Market Risk
Currently, the success of the Komsomolets Mine greenhouse project depends on establishing a market in the region for the vegetables which are grown in the project greenhouse. The Project Team stated that a market survey was performed. This survey was not available for review, but should be reviewed by stakeholders as soon as possible. Regarding the Kirova Mine project, the success of the project depends on the ability to either sell the resultant generated power to the grid, or offset the power needs of the mine. The mine will need assurance that it will continue to have an uninterrupted power supply. In order to insure this, standby power agreements need to be established between the mine and the primary power producer. If the mine project intends to sell power to the grid, then a power purchase agreement also needs to be established prior to project start-up.

Lack of Practical Experience
Coal companies and coal mines do not have any coal mine methane utilization experience. Also, other than Uglemetan, there are no companies in Russia that currently provide services for CMM recovery and utilization and specialize in this area. There are a number of technical experts with good theoretical knowledge of the field, but none have any practical experience.

Project Finances

Due the lack of significant progress and time constraint, the Mid-Term Evaluation did not investigate project financing "in-depth". General observations are as follows:

Project Disbursements

The total GEF contribution to the project's Phase I budget is 3.1 million USD. To date, the project has depleted only a small percentage of this amount.

To date, the largest expenditures include:

- Project design sub-contracts for Komsomolets coal mine demonstration project (VOSTNii, NOTEP, Institute of coal and chemistry SB RAS); and
- Expertise (review according to the national regulations) of project design.

The project has significant reserves in the following budget categories:

- Various sub-contracts;
- International technical assistance;
- Training and workshops; and
- Equipment.

To date there have been no allocations of funds for CMM recovery and use equipment purchases. This is significant because while the project is behind schedule, the schedule for allocation of funds is even further behind schedule. The majority of budgeted expenditures are related to the development of the demonstration projects. The vehicle for disbursement of funds against necessary expenditures will be the CMMRUC. The demonstration projects cannot start until the CMMRUC is formed, because some of the equipment to be purchased will become the property of the CMMRUC.

Financial planning for major project implementation

The Project Team has developed a CMMRUC Business Plan that presents a detailed discussion of how both demonstration projects are to be developed from a technical as well as financial standpoint. The Business Plan also presents a marketing strategy for sustainability of CMMRUC after completion of the Project.

The Business Plan currently being presented has been reviewed by all the key stakeholders in the Project and their comments have been addressed. Given that the economic assumptions used in the analyses presented for both demonstration projects are reasonable, the Komsomolets Mine boiler project and the Kirova Mine power generation project are economically sound.

All of the financial analyses were generated by Dmitry Islamov, who shares his time between Uglemetan, where he is the organization's Financial Specialist, and the Kemerovo Regional Administration, where he is the Chief of the Investment Policy Board. He has a thorough understanding of costs and revenues related to coalbed and coal mine methane use projects. A concern at this time, however, is that Dmitry Islamov is the only person being considered for the Chief Financial Officer's position for CMMRUC. A CFO is an important part of a company's management team often charged with the hard work of attracting the financing needed to move a company toward its goals. While Mr. Islamov has a strong academic background and several years of business and marketing experience with Uglemetan, it is unclear as to whether he has the knowledge and understanding required to help develop CMMRUC as a viable company that can take the lead in establishing coal mine methane recovery and use as an industry in Russia.

Budget procedure

The tracking procedures used by the Project Team to track actual costs versus budgeted costs were not available for review. Further to this, the methods used to quantify the in-kind cost contributions of the mines were also not presented.

However, project team has Quarterly Reports for the entire period of the project. These reports as well as other financial reports should be made readily available.

Effectiveness of funding mechanism

At this stage of the Project, not much can be said with regard to this effort since very little in the way of cash outlays have been made. Only after funding of the CMMRUC and implementation of the project has begun can this effort be evaluated. An indicator of Project progress is the allocation of funds; this function is not active at this time, which further reflects on overall Project progress.

Financial and Business Risks

One of the key issues in question is financial sustainability of CMMRUC beyond the GEF project. As already discussed, the Project Team has developed strong technical capacities for many aspects of coal mine methane recovery and use, including testing, project design, pre-feasibility and feasibility analysis, and project implementation. The Project Team has presented a business and marketing strategy for CMMRUC, including financing mechanisms that will be employed to sustain the company, yet there is still doubt as to the willingness of coal mines to actively participate in projects that are funded by the sale of emission reduction credits. The CMMRUC's primary source of income is projected to be derived from services provided for these types of projects.

The Business Plan developed for CMMRUC, presents the generation of revenues from sale of ERUs from projects at mines, developed at the rate of two projects per year. The implementation of these projects depends largely not only on the success of the two demonstration projects being executed under this Project, but on the dissemination of results arising from these successes. Coal mine methane projects in the Kuzbass will be competing with similar projects worldwide for investment dollars.

Recommendations

Corrective actions for the design, implementation, monitoring and evaluation of the project.

Project Delivery
In order for the demonstration project to be replicable and of interest to other mines, a net economic benefit should result from utilizing the gas. Without incorporating some end-use technology in the project design such as power generation or using the heat in a greenhouse, the sole benefit would be that the gas is destroyed in the boiler; but the heat generated would otherwise be wasted. Aside from the sale of the emissions reduction credits, additional opportunities for generating revenue are limited by the lack of a market for merchant power. Presently, the option of simply selling ERUs has little appeal to the coal mine managers and owners in the Kuzbass.

When assessing the value of a given choice for the destruction of CMM, there is negligible difference between combusting the gas in a boiler to supply heat to a greenhouse, or fuel supplied to a genset, or any other equipment that utilizes the gas directly or the heat generated as a result of gas combustion. The reasons for choosing the option of the greenhouse have been presented, and the plans to move forward with this option are finalized. An addition to this plan should be considered: installing a small electricity generating plant (<< 1 MW) in parallel with the boiler, supplying on site power. This would successfully demonstrate both technologies in one project, rather than two; and it should please all stakeholders and appease the critics. It still appears that not all stakeholders are fully supportive of the direction that the Project has taken. More pointedly, it is unclear as to whether the interests of certain current stakeholders are aligned with the goals of the project and they may be in conflict, thereby causing impediments to Project progress. Many of the stakeholders are in positions of power, but they are not using this power constructively to insure Project progress. At some point, all key stakeholders need to rally around the project to insure its success. Ultimately, the Project Team needs to align itself with persons and organizations that are totally supportive of the goals of the project and will actively work towards its success; without concern for personal gain.

Companies that are service providers or equipment suppliers should be empowered to become stakeholders in the Project. Since these companies should stand to benefit economically from the successful implementation and conclusion of the Project. Moreover, their corporate goals should be complimentary to those of the Project. Obviously, the details of each of these company's contributions would need to be negotiated to ensure that their participation contributes to the success of the project. One example would be Svetoprozrachnye Konstruktsii, Ltd., the manufacturer of the greenhouses used in the Komsomolets project. If the project is successful a new market for greenhouses (and supporting equipment and services) would be established. This company should be recognized as a stakeholder as the project moves forward

Project Implementation
The key outstanding issue under this task is the formation of CMMRUC. It is clear that Oleg Tailakov and Uglemetan will most likely transform into the CMMRUC that is described in the business plan. The simplest and most expedient solution would be to transfer all Uglemetan personnel and assets (and liabilities) into a newly formed CMMRUC and begin operating immediately. Enough time has been wasted and the business decision is a simple one.

The decision to utilize the heat generating by fueling boilers with CMM in greenhouses, and the subsequent financial projections for future project revenues were reportedly based on market surveys. These surveys should be summarized and included in the Business Plan.

The choice of utilizing heat in the greenhouse was justified for technological reasons as this was the only feasible option, due to the remote location of the boiler and the borehole. Marketing research was done to choose the product to be grown in the greenhouse. It was performed by Uglemetan staff through personal communication with representatives of vegetable growing companies, wholesale and retail companies and vegetable consumers (stores, restaurants and cafés) in the Kemerovo and neighboring regions.

and while the concept of creating a market for the sale of vegetables is sound, the practicality of it is not know at this time. The success of the project will therefore rely on the success of the demonstration projects and the dissemination of their results. A strategy has not been presented that elucidates the details of the plans for disseminating the project results, and therefore, great care should be put into developing this strategy as the success of not only the project, but CMMRUC, depends on it. Organizations such as the USEPA's Coalbed Methane Outreach Program have extensive experience in outreach efforts and should be consulted for advice.

The Project Document calls for the implementation of two demonstration projects initially; one at the Komsomolets Mine and one at the Kirova Mine. The schedules have been presented in the Business Plan and discussed previously in this report. Both of these projects are seriously behind schedule, and therefore, all efforts should be directed towards the successful execution of one project. The best candidate is the Komsomolets Project; and only after this project is operating, should CMMRUC initiate the second project. Mine management would most-likely support this decision as both mines are owned by SUEK and SUEK management must be involved in the decision-making process. The advantage to this plan would be that the first project would be implemented, satisfying the goals of the Project Document; while the implementation of the second project would clearly be viewed as a start towards proving replicability of the concept in the Kuzbass. In addition, lessons learned from the first could be directly applied to the second project.

The use of the web to report Project progress (and ultimately, project results) is effective, although, at present the web-site where progress should be reported has not been updated in several months. Little effort is required to keep this site up to date, and the benefits to all interested parties are well worth the effort. Keeping the web-site updated will be even more important once results are achieved from the demonstration projects. In addition, electronic progress memos should be sent to all interested parties. This would keep all stakeholders and interested parties abreast of progress and alert them of upcoming milestones and requirements, such as the need for cash or other resources.

With regard to project monitoring, there are several common methods used for tracking and monitoring progress; one is by tracking actual costs versus budgeted costs. Another method is to track the completion of subtasks and milestones against an original schedule. One very common tool for doing this is by using Gantt Charts[1]. Very simplistic Gantt Charts are included in the Business Plan, but because of their simplicity they really can only be used for presentation purposes.

The development and use of Gantt Charts as an active tool would allow the program team to develop a much more detailed schedule utilizing tasks, subtasks, and milestones, and allow the ability to link the completion of one task or subtask to the start of another.

The most important benefit accrued to the use of this tool would be to allow the Project Team to better manage the progress of all tasks, and at the same time, prepare charts and graphs to keep all stakeholders better informed as to progress and delays.

[1] Some of the more common software programs for project management that use Gantt Charts are Microsoft Project® and SmartDraw®.

Project Finances
The Business Plan has been reviewed by all interested parties, and most, if not all of their comments have been incorporated into the current version of the document. All stakeholders must now sign off on the document to ensure that there are no doubts about any details of project direction.

A cost-tracking system needs to be operating and functional before significant costs are incurred (equipment purchases and installation costs). This system could also be linked to the Gantt Chart which would enable more accurate up-to-date cost tracking and forecasting thereby giving UNDP a forewarning as to when large cash outlays are required.

While all of the issues discussed need to be addressed, the number one priority is to form the CMMRUC. Progress cannot happen until this is accomplished. The Project Team should take strong actions to ensure that this happens immediately.

Proposals for future directions underlining main objectives

The overarching goal of the Project is to demonstrate that there is a technical basis and a commercial market for CMM use in the Kuzbass. Sound plans have been developed for constructing and operating two coal mine methane utilization projects. It is time to implement these plans; all technologies proposed are currently operating commercially in other gassy mining regions of the world. This can be accomplished by 1) funding the CMMRUC, and 2) getting the demonstration projects operating in the fashion recommended above. All efforts should be put towards accomplishing these two objectives. Due to the delays in implementing the demonstration projects and formation of CMMRUC, the scheduled finish date must be extended. This is the appropriate time to reconfigure the project plans so that one project is fully implemented before the second is initiated.

Lessons Learned

Best and worst practices in addressing issues relating to relevance, performance and success

The most important lesson to take away from this Project to date is that the original program schedule should have been adhered to, which called for first establishing the CMMRUC. The critical path to project success should be determined and this path should be followed during project implementation. Many of the problems and delays have occurred because of the lack of an established company that has the authority (and support of all stakeholders) to address Project issues and execute Project tasks.

The failure to first form the CMMRUC and the subsequent issues that resulted occurred because the decision-making process appears to have been relegated to a committee. To compound this, it appears that an open forum for stakeholders to discuss and resolve all issues does not exist. This situation has resulted in delays and continues to hamper progress. Responsibilities of the Project Management Team need to be spelled out very clearly, and each member should be given the resources necessary to execute the responsibilities. Only then can each member be held accountable for their responsibilities.