BLACK SEA TRADE AND DEVELOPMENT BANK

Case Study: Enhancing the Performance of a major environmental Project in Bulgaria financed by BSTDB

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8. Enhancing The Performance Of A Major Environmental Project in Bulgaria[1]

Prior to privatization, KCM,[2] a Bulgarian metallurgical and chemical production company, had been responsible for widespread hazardous contamination of large residential and agricultural areas. Following privatization, the Black Sea Trade and Development Bank approved in 2001 a six year loan to finance improved environmental technology and operating methods, and to avoid the risk of the company having to restrict or even terminate operations. The case study describes a "Focused Mid-term Evaluation" that recommended: (a) speedier implementation of the environmental action plan advancing the starting date of production of zinc and chemicals, (b) improved enforcement of safety policies reducing accidents and avoiding fines for non-compliance, and (c) a hedging strategy permitting KCM to compensate for falling metal prices. It is estimated that the implementation of the evaluation recommendations produced at least $135,000, and possibly up to $500,000, of economic benefits, which compares favorably with the estimated cost of the evaluation of around $4,500.

The Black Sea Trade and Development Bank (BSTDB) commenced operations in 1999. In order to strengthen projects that are new for the Bank, the Post Evaluation Department developed a methodology for Focused Mid-Term Evaluations (FMTE). The methodology is designed to have a high benefit-cost ratio through identifying a limited number of potential problems which could be corrected or where impact could be enhanced. This case study illustrates how the FMTE methodology was applied in 2002 to detect and address potential problems regarding a major environmental project in Bulgaria.

Background: the KCM Environmental Improvement Project

Prior to its privatization, KCM operations had been responsible for widespread hazardous contamination of large residential and agricultural areas. In 2001 the BSTDB approved a six year US$9.2 million loan to KCM to finance some components of a large-scale environmental project in Bulgaria.[3] The project applies BSTDB's environmental policy by promoting the introduction of improved environmental technology and operating methods. The project is also intended to avoid the situation where it would have become necessary to restrict or even terminate operations, thus placing at risk 1540 jobs in an economically depressed area and 1.31% of Bulgaria's annual exports.[4]

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[1] This case study was prepared by Todor Dimitrov, Manager, Post Evaluation Department, Black Sea Trade and Development Bank.

[2] Kombinat za Czvetni Metali S.A.

[3] These components include the installation of: (i) a central waste water treatment plant to reduce the discharge of heavy metals and other harmful effluent to nearby rivers which are used for irrigation; (ii) a closed-water-circle technology to reduce industrial wastewater discharge from 300 to 4 m3/h; (iii) expansion of the zinc cake filtering department, including new ventilation to reduce by 80% harmful dust and acid emissions that cause serious respiratory and other health damages; and (iv) modernization of the zinc tank house including better air ventilation.

[4] All data relate to 2002, except the total export figure which relates to 2001.

The Three Step Evaluation Methodology

In order to learn from important experiences as soon as possible, the Post Evaluation Department (PED) performs, in addition to routine post-evaluation, Focused Mid-Term Evaluations (FMTEs). PED applies a three-step methodology to ensure evaluation cost-effectiveness. The three steps, whose application to the environmental project is illustrated below, are:

Step 1: Sampling and Timing: A nine-point rating scale is used to assess the need and justification for a particular FMTE (see Table 1). In order to justify a FMTE positive ("yes") answers must be obtained for Questions 1-4 as well as at least three of the remaining five questions.

Table 1: Applying the 9 Question Checklist to the Environmental Project

Q1	***Is there any evidence suggesting that project performance is at stake or off track?*** **Answer: Yes.** (i) Output (zinc and lead) prices reached record low levels, 25% below worst case appraisal projections; (ii) several publications suggested that the enterprise continues to cause environmental and health risks, and; (iii) some publications anticipated a financial loss for 2001.
Q2	***Could a project failure have a severe negative impact on the Borrower, the Country or the Bank?*** **Answer: Yes.** The Borrower may have to downscale operations and staffing levels, or even closedown. If the latter the country might lose 1.31% of its export revenues, 1540 jobs, and might experience severe environmental damages. In addition, the BSTDB might may face a major challenge to its reputation and mandate.
Q3	***Are the estimated costs to conduct the evaluation below 0.1% of the loan amount?*** **Answer**: **Yes.** The cost of the evaluation was estimated at $4,500 which is 0.05% of the $9.2 million project loan.
Q4	***Is the Borrower committed to support FMTE in view of enhancing further performance?*** **Answer: Yes.** The Borrower's commitment and cooperation were and are excellent.
Q5	***Is PED able to ensure access to relevant lessons learned?*** **Answer: Yes.** PED has built a database of relevant external lessons learned.
Q6	***Is it clear that a solution to the problem (workout) is not in progress?*** **Answer: Yes.** It is clear that prior to the evaluation no solution (workout) had been identified or implemented.
Q7	***Does the project represent a relatively new activity or sector for the Bank?*** **Answer: Yes.** The first and only environmental project, implying a significant learning potential.
Q8	***Are there well-defined project stages that have been completed?*** **Answer: Yes.** Delivery, installation and testing of several components (30%) completed.
Q9	Is the Bank's management committed to use the FMTE for enhancing performance? **Answer: Yes.** The FMTE was requested for that purpose by the BSTDB's Vice President for Banking.

Step 2: Focus: A brief desk review explores some of the initial screening questions in more depth to: define the type of risks and to identify the indicators that may confirm or reject these risks (Question 1); determine the Borrower's commitment and whether lessons can be learned which can be applied to other projects (Questions 3 and 4); and determine the policy implications—project-specific or wider (Questions 7 to 9).

Step 3: Evaluation: An FMTE is only conducted if the expected benefits from the evaluation are at least twice its expected cost. To ensure a high benefit-cost ratio, evaluations focus on potential problems which can be mitigated, or areas in which impacts can be enhanced. If initial analysis shows the potential problems to be less serious, or more intractable than initially assumed, the FMTE is immediately terminated. If, however, the concerns are confirmed, a rapid evaluation is conducted using interviews, focus groups and direct observation. Key assumptions are verified by triangulation: cross-checking essential information and evidence from at least three independent sources, such as borrower, industry or peer data, market analysts, and local community (NGOs, workers, press). Once the evaluation has been completed, attribution analysis is used to assess its impacts through the construction of counterfactuals and by comparing actual data with appraisal projections.

Application of the FMTE Methodology to the Environmental Project

The FMTE process and findings, obtained through the three steps described above, are summarized as follows:

Step 1: Sampling—Why FMTE for This Project?

Given the positive response to all nine checklist questions (Table 1), PED concluded that there was a clear justification for an FMTE for the following reasons:

- If financial, management or other developments (Answer 1) cause a failure to implement the environmental project in a timely manner, there might be serious social and economic losses (Answer 2) including down-scaling or closing the enterprise, loss of 1.31% of national export revenue and up to 1540 jobs as well as severe environmental damage; and
- On the positive side, Answers 4 to 9 suggest a good potential for cost-effectiveness and impact with strong management support for the implementation of the recommendations.

Step 2: Focus

Through a further desk study (including collection of data from project files, NGOs, press, official statistics, etc.), it was confirmed that without the implementation of the evaluation recommendations, the risks outlined under (i) above were very likely to occur. It was therefore decided that the FMTE should focus on (a) environmental impacts, progress and prospects in implementing the environmental project, and (b) mitigating the negative effects of zinc and lead price developments on the project's effectiveness and sustainability.

Step 3: The Evaluation

The methods used included a desk review and a two-day field visit to the borrower's site and a neighboring community. The evaluation took two months to complete. Through the field visit, the evaluation conducted:

- two focus groups, guided by open-ended questionnaires: one with the borrower's management and one with representatives of the local community;
- three semi-structured interviews with the borrower's managers and staff and a key project contractor; and
- three site verifications on compliance with randomly selected components of the project, the environmental action plan (EAP), and the use and availability of new equipment and technology. Unobtrusive observations of safety measures such as smoking restrictions, use of helmets, and monitoring of toxic gases and substances were also conducted.[5]

To ensure independence and avoid any concern that the FMTE was conducted to justify a pre-decided action, such as continuation of a sensitive project, the following procedures were used:

- Clear articulation of the project risks, stakeholders' commitment and external lessons learned—identified upon the FMTE outset through Answers 1, 4, 5 and 9;
- Triangulation, i.e. obtaining and comparing sensitive data from at least three independent sources, e.g. BSTDB, Borrower, contractor, press, NGO or local community, external auditors, on-site observation and verification. For example, data on measures to prevent the use of waste water being used for irrigation or any other inappropriate purpose (as part of the EAP) were obtained from the borrower, local farmers, and from on-site observation of the installed "Danger" sign-posts. Comparing these data, the evaluation concluded that while potentially harmful use of waste-water has been considerably reduced, further efforts (concrete sealing of the waste water canal) were needed to achieve full compliance with the EAP, as the hazardous waste waters are easily accessible by animals and humans; and
- Observing the ECG[6] good practice standards, ensuring independence from operations. For example, the PED is obliged to report to the BSTDB President any subtle pressure on the evaluation process that might compromise its objectiveness.

[5] With unobtrusive observation, the evaluator observes staff without asking questions or explaining the purpose of the evaluation. In the KCM case, the evaluator used the pretext of checking on the installation of environmental equipment to visit without prior notice many different locations of the industrial site. He dressed exactly as other workers, and unobtrusively took note of compliance with some of the safety requirements, e.g. use of helmets and other protective gear, smoking restrictions, etc.

[6] Evaluation Cooperation Group of the Multilateral Development Banks, a source of good practice standards and harmonization in evaluation.

FMTE Findings, Recommendations and Impact

Assessing the Contribution of the FMTE to Improved Project Performance

In order to assess the extent to which the positive impacts could be attributed to the evaluation, and not to other concurrent factors, the PED conducted simulation and extrapolation of cause-effect trends on the basis of with-and-without FMTE scenarios. The "without" scenario was estimated on the basis of assumptions about: (i) the critical mass of information that would have had to reach the Bank in order for it to have independently decided to implement measures which were recommended in the evaluation; (ii) how long it would have taken to reach these decisions and (iii) the likelihood that these decisions would have been taken.[7] The simulation estimates have been tested and confirmed through rigorous comparisons of data and projections from three key sources (i) project files and management; (ii) borrower's financial department (independent from operations); and (iii) estimates and projections on EAP and project timing and impact for each component, done by the borrower's engineering and environmental teams, independently verified by the Bank's environmental unit. For example, PED estimated that, given KCM's misunderstanding of the hedging covenant and their focus on hedging and cost-saving issues, it is possible that KCM would not have recognized and addressed these off-track signals until the second quarter of 2003, if not later. By that time, the negative developments would have been sufficient to require a monitoring review and eventual project enhancement. Moreover, it is quite possible that these measures may have only partially addressed the issues, and at a much higher cost (due to late timing).

A follow-up stakeholder survey with KCM and BSTDB (summarized in Box 1) confirmed that both organizations found the evaluation to have been useful. Both agreed with it, and implemented the main recommendations. They also agreed with the estimated benefits resulting from the evaluation.

Evaluation Findings, Recommendations and Impacts[8]

It is noteworthy that, while the impacts described below have been triggered by the FMTE, they could not have been achieved without the strong commitment of the BSTDB and the Borrower. Three sets of findings are presented below:

Finding 1: *Due to the borrower's concern with mitigating the effects of falling commodity prices, the implementation of the EAP had not been given sufficient priority and progress was vaguely reported. In the effort to mitigate the price effects, the Borrower breached a hedging covenant.*

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[7] The extrapolations took into account the following: (a) the continuous low levels of price and revenue throughout 2002 and 2003 (confirmed by independent market analysts); (b) likely delays in implementing, and reporting on the EAP due to preoccupation with cash-flow mitigation and cost saving; and (c) the implications of the continued and cumulative breach of the hedging covenant, exceeding the allowed ceiling by a factor of four, which arose because the borrower did not understand the legal requirements.

[8] Some of the checklist components were ambiguous in terms of attribution, and therefore are not presented here.

Recommendation: (i) Enhance the EAP implementation and reporting, and (ii) adjust the covenant in line with industry hedging norms.

Impact: The timely adjustment of the hedging covenant helped mitigate price volatility risks by ensuring a hedging resource three times greater than the one previously available. This allowed the implementation of the EAP to be advanced by at least three months, reducing the environmental hazards by 25% overall and in some areas by 80%, and preventing likely implementation delays of three to twelve months.

It could be argued that if the project was forced to close, the environmental hazards would have ceased, so that the above mentioned environmental improvements should not be considered as a benefit (compared to the counterfactual). However, without the evaluation, the environmental hazards would have been bigger and would have lasted longer because the project would have continued—downscaling or closure (effectively terminating the source of pollution) would have happened only after a further contamination and health loss.

Box 1: Client Feedback on the Utility and Accuracy of the Evaluation

Both KCM and the Black Sea Trade and Development Bank (BSTDB) were consulted on the utility of the evaluation and on its estimated benefits to the project. Most of the responses were given by e-mail with follow-up discussions where necessary. The **KCM Project Team and Management** prepared a consolidated response to the survey indicating that they were generally in agreement with the contents of the evaluation and that they had found the conclusions useful for: improvement of the project; timely provision of information to the Bank; and for the reformulation of the financial covenant for commodity hedging. They also agreed with the estimate that the evaluation had produced at least $135,000 in benefits as a result of earlier utilization of the capacity for production of zinc and H2S04. They found the recommendations concerning hedging to have been particularly useful. Finally, KCM appreciated the fact that the evaluation only required about 1-2 days of management time for discussion and correspondence.

The **BSTDB Project Team Leader and the Vice President for Banking** also prepared a consolidated response. They found the evaluation very comprehensive and in-depth and found it useful because it helped them "keep an eye on the project in addition to monitoring which may sometimes be subjective and is based mainly on information provided by the client." The recommendations concerning hedging and breach of covenants were considered particularly useful as the KCM project "has been even now in breach of covenants." BSTDB also agreed was the estimate that the evaluation produced at least $135,000 in benefits.

Source: Follow-up stakeholder survey conducted by the BSTDB Post Evaluation Department, May 2003.

Assuming that all of the observed benefits and impacts could be attributed directly, and exclusively, to the evaluation, the economic benefit of the evaluation, including an enhancement of the project's sustainability, could be estimated in the range of $542,000 to $1,084,000 depending on the assumptions made about market prices. Two examples are given to illustrate how the impact was estimated. First, a key project component, the

air filtering system was originally expected to be operational by January 2003, but implementation was speeded-up due to the FMTE and the facility commenced operations in October 2002. The direct effects of making the filtering facility operational three months ahead of schedule were: a zinc output gain of 1,000 tons translating into a maximum revenue and export gain of $800,000. To obtain a more conservative estimate which assumes less favorable market prices—involving a reduction in sales by 50 per cent—gives a lower-range impact of $400,000. Second, resolving a covenant issue without the FMTE, could have taken an additional ten months. In turn, the implementation of several EAP components would have experienced a similar delay. For example, accelerating the introduction of a new technology for producing H2SO4, enabled the borrower to produce 12,500 tons more H2SO4 (without harming the environment), and this has a monetary value of $222,000. A lower range estimate is produced by reducing this by 50 per cent. In addition, the air filtering work, combined with other EAP measures, allowed the borrower to reduce the cost of environmental non-compliance penalties for harmful air emissions from $73,000 in 2002 to $44,000, and to reduce the cases of industrial sickness (basically the toxic effects of heavy metals resulting in long-term health damage) from 1-5 cases per year to zero at the end of 2002.

Finding 2: *Weak enforcement of new safety procedures*.

Recommendation: Enhance or speed up implementation of various measures already underway, such as financial incentives.

Impact: Recommendations helped achieve a reduction in the number of accidents at work from 30 accidents in 2001 to 22 in 2002. While it is difficult to assign a monetary value to such benefits, an indicative estimate of $100,000 has been calculated taking into account factors such as average days of absence per accident (21), production interruption costs, the salary costs for the time of absence, the loss of staff income and social costs (average hospitalization cost per accident). The "without-FMTE" scenario has a likely delay of at least four months in addressing these measures (due to apparent project "off-track" developments). Consequently it was assumed that one third of the reduction ($33,000) could be attributed to the FMTE, with a low-case estimate of $16,500.

Costs, Timing and Cost-Effectiveness of the FMTE

The evaluation was conducted as early as possible (one year after project inception) and took two months to complete. The FMTE cost was estimated at $4,500—well below the benchmark of $9,200, with the following breakdown: 75% PED staff time, 10% site visit, 10% data collection and processing, and 5% other costs. The evaluation did not require external evaluators' costs. The borrower's effort was kept minimal—two person-days. The low cost and early timing, along with the sampling methodology, ensured a good cost-effectiveness, i.e. a prompt and efficient mitigation of apparent risks in a strategically important project.

Based on the estimates presented above, and assuming that all of the impacts are due directly and exclusively to the FMTE, the estimated economic benefits are in the range of $542,000 - $1,084,000. These estimates are summarized in Table 2.

Table 2. Estimated Range of Economic Benefits[a]

Type of Benefit	Upper estimate $	Lower estimate (50% reduction) $
Increased production of zinc—from starting production 3 months earlier	800,000	400,000
Increased production of H2S04—starting production 10 months earlier	220,000	110,000
Reduced fines from non-compliance with environmental regulations	29,000	14,500
Reduced accidents from enforcement of safety regulations	33,000	16,500
Total	**1,082,000**	**542,000**

[a] On the assumption that the FMTE was directly and exclusively responsible for all of the observed impacts.

However, an evaluation almost never operates in a vacuum and there are always other sources of information and other factors influencing management decisions. In the case of the KCM project it would appear that the evaluation made a significant contribution by bringing to the attention of management a number of issues and opportunities of which they had not been aware and on which actions would probably not have been taken for several months or even longer. Consequently, even when other factors are taken into consideration it seems that the FMTE made an important contribution to ensuring that the required actions were taken in a timely manner and hence generated a significant part of the economic benefits. Even if we assume that other influences were also operating, it is reasonable to assume the FMTE was responsible for producing at least 25 per cent of the impact which would mean, using the most conservative estimates in Table 2, that the evaluation produced at least $135,000 in economic benefits, which still compares very favorably with the estimated cost of $4,500 to conduct the evaluation.