Terminal Evaluation Review form, GEF Independent Evaluation Office, APR 2015

1. Project Data

Summary project data			
GEF project ID		127	
GEF Agency project ID		45572	
GEF Replenishment Phase		GEF-1	
Lead GEF Agency (include all for joint projects)		World Bank	
Project name		Kyjov Waste Heat Utilization	
Country/Countries		Czech Republic	
Region		Europe and Central Asia (ECA)	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		OP-1	
Executing agencies involved		Ministry of the Environment (MoE); Teplarna Kyjov (TPK); TEPLO KYJOV	
NGOs/CBOs involvement		Not specified	
Private sector involvement		TEPLO KYJOV (secondary executing agency)	
CEO Endorsement (FSP) /Approval date (MSP)		July 27, 1998	
Effectiveness date / project start		November 18, 1998	
Expected date of project completion (at start)		June 30, 2000	
Actual date of project completion		March 31, 2001	
Project Financing			
		At Endorsement (US $M)	**At Completion (US $M)**
Project Preparation Grant	GEF funding		
	Co-financing		
GEF Project Grant		5.8	6.04
Co-financing	IA own		
	Government	.52	.56
	Other multi- /bi-laterals		
	Private sector[1]	18.62	19.44
	NGOs/CSOs		
Total GEF funding		5.8	6.04
Total Co-financing		19.14	20
Total project funding (GEF grant(s) + co-financing)		24.94	26.04
Terminal evaluation/review information			
TE completion date		October 15, 2001	
Author of TE		J. Christian Duvigneau and Victor B. Loksha	
Original GEF TER preparer (2002)		Antonio Del Mónaco	

[1] The TE does not provide disaggregated co-financing information. Co-financing at endorsement and completion is an aggregation of funding provided by Hypovereinsbank (private bank); State Environmental Fund (state entity); and Teplarna Kyjov (private company).

Original GEF TER reviewer (2002)	C. Volonte and R. Ramankutty
TER completion date	June 13, 2016
TER prepared by	Laura Nissley
TER peer review by (if GEF IEO review)	Molly Watts

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	S	S	MS	MS
Sustainability of Outcomes		L	L	MU
M&E Design		NR	NR	MU
M&E Implementation		NR	NR	UA
Quality of Implementation		HS	S	MU
Quality of Execution		HS	S	MS
Quality of the Terminal Evaluation Report		--	S	MU

3. Project Objectives

3.1 Global Environmental Objectives of the project:

The Global Environmental Objective of the project was to decrease the emissions of greenhouse gases (GHG) by "means of increasing the efficiency and reliability of the heat supply to the City of Kyjov, and of the heat and power supply to the Vetropack Moravia Glass (VMG) through intensified use of waste process heat generated at VMG" (PD pg. 2).

3.2 Development Objectives of the project:

The Development Objectives of the project were to: 1) demonstrate a gas-fired, combined-cycle cogeneration system in the Czech Republic where this technology is not widely used; 2) stimulate technological and institutional changes that would promote energy efficiency through developing CHP systems for joint industrial and municipal purposes; 3) achieve local environmental benefits by reducing the proportion of pollution intensive-fuels (such as lignite) in the fuel mix used for heat and power supply; 4) demonstrate the possibility of cooperative efforts between the Czech Ministry of the Environment (MoE) and the private sector in enhancing the environmental benefits from such a project (PD pg. 2).

The Project Document outlines five programmatic components in support of these objectives (PD pgs. 6-7):

- **Component 1:** Combined Heat and Power Plant
- **Component 2:** Replacement and Retrofitting of Boilers at the Glass Factory
- **Component 3:** Construction and Reconstruction of Building at the Glass Factory
- **Component 4:** Modernization and Expansion of the District Heating Network of Kyjov
- **Component 5:** Decommissioning of Gas-Fired Boilers and Replacement with Heat Exchangers

3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

The Global Environmental Objective and Development Objectives remained the same throughout implementation. The TE notes that minor modifications were made to the design of the CHP system to improve efficiencies of the sub-components (water heat boiler, gas turbine, and steam turbine). Additionally, modifications were made to the heat exchanger system at the hospital (TE pg. 3).

4. GEF IEO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 **Relevance**	Rating: **Satisfactory**

The TE does not provide a rating for project relevance,[2] while this TER provides a rating of **Satisfactory**. The project's objectives were consistent with the Climate Change focal area, as conceived under GEF-1, particularly provisions for short-term response measures. The Project Document notes that the design meets the criteria for short-term measures, including national priority and cost-effectiveness in CO_2 emission reduction. The Project Document also notes that the project contributed to the long-term measure of removing barriers to energy conservation and energy efficiency (Operational Program 1). The project aimed to address the "the institutional weaknesses and lost market opportunities resulting from the lack of information about the feasibility and significance of the low-cost CO_2 reductions offered by CHP [Combined Heat and Power] generation" (PD pg. 3).

The project objectives were also consistent with the country's climate change priorities, particularly the first Czech National Communication to the United National Framework Convention on Climate Change (UNFCCC) submitted in September 1994. The National Communication specifically identified cogeneration and district heating as priority measures for the country (PD pg. 3).

[2] The TE, or Implementation Completion Report, does not include individual ratings for project relevance, effectiveness, or efficiency.

4.2 **Effectiveness**	Rating: **Moderately Satisfactory**

This TER provides a rating of **Moderately Satisfactory** for project effectiveness. The project achieved its global environmental objective of decreasing the emissions of greenhouse gases by improving the efficiency of power and heat generation in Kyjov. The project contributed to a reduction of 165,000 tons of CO_2. Although this was 7% lower than anticipated, the original GEF TER notes that this shortfall was within the uncertainty margins associated with the life of the project (line 40).

The TE does not adequately assess the achievement of the project's development objectives. As the ICR Review and original GEF TER note, the TE does not provide any information regarding the demonstration impact of gas-fired combined-cycle cogeneration (Objective 1) or the achievement of local environmental benefits (Objective 3). The project did demonstrate the technological and institutional changes necessary to promote energy efficiency through the development of a Combined Heat and Water Plant (Objective 2). The project also demonstrated that public and private entities could cooperate in executing projects with environmental benefits (Objective 4), through the establishment of Teplarna Kyjov, which had public and private shareholders (ICR Review pg. 2; GEF TER lines 41-42).

Despite the deficiencies in tracking and reporting on the achievement of development objectives, it should be noted that the project largely achieved all of its outputs, or components. Moderate shortcomings included lower than expected electricity and heat production from the new CHP Plant.

A summary of the project's achievements, by component, is provided below:

- **Component 1:** Combined Heat and Power Plant
  Under this component, it was expected that a new gas-fired combined-cycle heat and power plant (CHP Plant) would be installed. The CHP Plant would be comprised of two gas turbines and one steam-driven turbine, with an annual electricity output of 183 GWh and heat production of 196.6 TJ. Due to the limited availability of the plant, electricity production was lower than expected, with a total of 158.3 GWh sold to the glass factory and regional electric grid. Due to lower than expected demand, the sale of heat was also below target, with a total sale of 148.9 TJ (TE pgs. 8-9).

- **Component 2:** Replacement and Retrofitting of Boilers at the Glass Factory
  Under this component, it was expected that one new waste heat boiler would be installed and one existing boiler would be retrofitted. Additionally, one hot water boiler would be replaced by a steam boiler. This component was fully achieved by project end (TE pgs. 7-8)

- **Component 3:** Construction and Reconstruction of Building at the Glass Factory
  Under this component, it was expected that the existing buildings at the Glass Factory would be modified to house the CHP Plant. Additionally, new administration offices, storage facilities, and an electric transformer station building would be constructed. This component was fully achieved by project end (TE pg. 3).

- **Component 4:** Modernization and Expansion of the District Heating Network of Kyjov
  Under this component, it was expected that the centralized district heating network would be capable of carrying a thermal output of 19MW. It was also expected that six kilometers of pre-insulated pipes would be installed, along with accompanying instrumentation and control cables. The TE notes that this component was executed as planned (pg. 3).

- **Component 5:** Decommissioning of Gas-Fired Boilers and Replacement with Heat Exchangers
  Under this component, it was expected that 13 gas-fired boilers would be decommissioned and replaced with heat exchangers and linkages to the centralized district heating network. The target for this component was exceeded, with 15 boilers decommissioned by project end. Additionally, several new customers in the city were connected with the centralized heating system, including: the Municipal House, the House of Culture, and a primary school building (TE pg. 12).

4.3 **Efficiency**	Rating: **Moderately Unsatisfactory**

This TER provides a rating of **Moderately Unsatisfactory** for project efficiency. The project experienced moderate delays at start-up due to problems with the efficiency of the CHP Plant, particularly the gas consumption of the gas turbines and the lower than expected efficiency of the steam turbine. The repeated testing of the system meant that the availability of the CHP Plant was lower than expected Despite numerous improvements to the system, the TE estimates that CHP Plant will have lower efficiencies (2% to 4%) and higher gas consumption (3% to 8%) than originally estimated (pgs. 5-6). Additionally, the financial performance of the CHP Plant had deteriorated significantly by the end of the project due to (1) reduced revenues; (2) increased capital and operating costs (including maintenance costs); (3) power oversupply from lignite-burning and nuclear plants; and (d) low tariffs controlled by the government (GEF TER line 45). The TE estimates that the Internal Rate of Return (IRR) for the project was 7.8%, taking into account the GEF grant, compared to the expected 18.4% (pg. 15). The project experienced some cost savings by making use of the existing buildings at Teplarna Kyjov (TPK), however costs were higher than expected for the other components (TE pg. 3). Overall, project costs were 4.4% higher than what was estimated at appraisal (TE pg. 18).

4.4 **Sustainability**	Rating: **Moderately Unlikely**

The TE provides a rating of **Likely** for project sustainability, while this TER provides a rating of **Moderately Unlikely**.[3] At project end, there were significant financial risks to sustainability due to the poor financial performance of the CHP Plant and the unfavorable contractual obligations. Sociopolitical

[3] This rating is supported by the original GEF TER, which indicates that "the rating for sustainability should not be likely" (line 56).

sustainability was also threatened due to the low consumer demand for heat and the government's reluctance to close old, depreciated coal-fired plants. Additionally, the energy sector policies in the Czech Republic threatened the long-term objectives of the project.

Financial Resources

This TER provides a rating of **Moderately Unlikely** for the sustainability of financial resources. As noted above, the financial performance of the CHP Plant had deteriorated significantly. At project end, the company operating the CHP Plant, Teplarna Kyjov (TPK), was making a net loss due to the high costs of gas and the low sales price of electricity. The ICR Review indicates that the operating profits for TPK in 2002 were projected to be only 39.3% of projections at the design stage, and operating costs were expected to be 213% higher. Additionally, the original GEF TER and ICR Review note that the price structure could motivate some shareholders of TPK to abandon their contractual obligations. Under the current contracts, the TPK is must sell electricity and heat to the glass factory at concessional prices. Additionally, the regional electric grid is required to buy electricity from TPK at prices that are higher than the current market price. As a result, both TPK and the regional electric grid are suffering losses (ICR Review pg. 3; GEF TER lines 31-32).

Sociopolitical

This TER provides a rating of **Moderately Unlikely** for sociopolitical sustainability. While the project demonstrated that public and private entities could cooperate in executing projects with environmental benefits, the unfavorable price structure under the current contracts could threaten the commitment of stakeholders. Additionally, the demand for heat among end users had diminished during project implementation due energy conservation measures taken by consumers, warm winters, some conversion to gas, and efficiency improvements in the district heating network (ICR Review pg. 3). The government has also shown its reluctance to close old, depreciated coal-fired plants due to employment concerns, low operating costs, and exports to neighboring countries (TE pg. 13). All of these factors represent significant risks to sociopolitical sustainability.

Institutional Framework and Governance

This TER provides a rating of **Moderately Unlikely** for the sustainability of institutional frameworks and governance. The TE indicates that the Czech energy sector policies, including the maintenance of low electricity prices, are unfavorable to the long-term objectives of the project. The cross-subsidy on gas prices also favors small gas consumers and households, and at the expense of large gas consumers, makes it difficult for TPK to compete with small individual gas boilers. The TE notes that there is a possibility the government initiate deregulation policies in its pursuit of joining the European Union, however this had not emerged by project end (pg. 17). It should be noted that another gas-fired CHP Plant in Czech Republic was shut down because of the low power price regime in the country (GEF TER line 28).

Environmental

The TE does not provide enough information to adequately assess the environmental sustainability of the project. It is clear however, that risks do exist, such as the continued presence and use of old, depreciated coal-fired power plants in the Czech Republic.

5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

Actual co-financing was higher than expected at appraisal ($20 million vs. $19.14 million). The State Environmental Fund (SEF), Hypovereinsbank, and the City of Kijov provided co-financing in the form grants and loan facilities. The TE does not directly state the reason for the overall higher than expected co-financing, but project costs were 4.4% higher than the estimates at appraisal. The TE does note that the City of Kyjov contributed an additional $.15 million due to the higher than expected costs associated with the boiler conversions (pg. 18).

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

As noted above, the project experienced moderate delays at start-up due to problems with the efficiency of the CHP Plant, particularly the gas consumption of the gas turbines and the lower than expected efficiency of the steam turbine (TE pg. 5). The time required to implement improvement measures at the CHP Plant resulted in a nine-month extension of the project's timeline (TE pg. 21).

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

The TE does not directly assess country ownership over the project. The Ministry of Environment was responsible for supervising and monitoring project implementation, including financial management and coordination of activities. The TE notes that the government ensured adherence to environmental standards and approved construction permits (pg. 16). While country ownership over the project facilitated activities, energy sector policies hindered the long-term sustainability of project outcomes. Specifically, the maintenance of low electricity prices, reluctance to close coal-fired plants, and the cross-subsidy on gas prices.

6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately

Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 **M&E Design at entry**	Rating: **Moderately Unsatisfactory**

The TE does not provide a rating for M&E design at entry, while this TER provides a rating of **Moderately Unsatisfactory**.[4] The Project Design Summary, or framework, provided in the Project Document outlines the expected results, key performance indicators, data sources, and critical assumptions. This framework is limited in value however, as it does not fully reflect the expected results outlined in the narrative. For example, Objective 4 (i.e. demonstrate the possibility of cooperative efforts between the Czech Ministry of the Environment and the private sector) is completely omitted from the framework. Other objectives, such as Objective 2, are loosely rolled into broad results statements, in this case: *reduce emissions of GHG from the Kyjov district heating system, simultaneously increasing the energy-efficiency and reliability of heat and power supply*. While some of the key performance indicators are SMART (specific, measurable, achievable, relevant, and timely), they are by no means comprehensive. Additionally, the only target value provided is for the amount of power and heat delivered to users (PD pgs. 21-23).

Limited provisions for M&E are peppered throughout the Project Document, however a comprehensive M&E plan is not included. For example, the responsibility of the Ministry of Environment to coordinate M&E is noted in the "executing agencies" section, and "data to be monitored" is outlined in the financial management section (PD pgs. 13-14). The Project Document also implies that funding for M&E will be included under the supervision and dissemination component of the project (PD pg. 7). However, the total budget for this component is only $120,000 or 2% of GEF funding. Overall, the M&E design has significant shortcomings, and therefore a rating of Moderately Unsatisfactory is justified.

6.2 **M&E Implementation**	Rating: **Unable to Assess**

The TE does not provide any information regarding the set-up and implementation of a project M&E system. It does appear that the project collected data on some indicators, including CO_2 emission abatement and cost. Noticeably absent was any data on the impact of the demonstration project and local environmental benefits (GEF TER line 37). Overall, there is not enough information to assess the quality of M&E implementation.

[4] The original GEF TER provides a congruent rating of Moderately Unsatisfactory for M&E (line 37).

7. Assessment of project implementation and execution

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 **Quality of Project Implementation**	Rating: **Moderately Unsatisfactory**

The TE provides a rating of **Highly Satisfactory** for World Bank Performance, which this TER downgrades to **Moderately Unsatisfactory** for quality of project implementation. As the original GEF TER notes, the project design was not logically sound and did not clearly articulate the links between the Development Objectives and components (line 27). These deficiencies in the project design are reflected in the weak M&E framework outlined in the Project Document. Additionally, the World Bank did not consider key risks to the achievement of outcomes and sustainability. In particular, the ICR Review notes that the World Bank did not consider possible reductions in projected heat demand, despite the fact that other World Bank district heat projects in the region had shown poor financial performance for this reason (pg. 4). The original GEF TER also notes that the World Bank should have considered more carefully the other gas-fired CHP plant that was shut down due to the price subsidies in place in the Czech Republic (lines 50-51).

The TE does indicate that the World Bank supervision was strong throughout implementation, as evidenced by the frequent supervision missions and technical assistance provided, particularly regarding improvements to the CHP Plant (TE pgs. 20-21). However, it should also be noted that the World Bank did not provide sufficient oversight regarding the contractual arrangements for maintenance of the CHP Plant or the conditions for the efficiency of the gas turbines, both of which impacted the operating costs and ultimately, the financial sustainability of the project (ICR Review pg. 4; GEF TER lines 53-54). Due to significant shortcomings in the design and oversight, a rating of Moderately Unsatisfactory is justified.

7.2 **Quality of Project Execution**	Rating: **Moderately Satisfactory**

The TE provides a rating of **Highly Satisfactory** for Borrower Performance, which this TER downgrades to **Moderately Satisfactory** for quality of project execution. The primary executing agency was the Ministry of Environment, which was responsible for supervising and monitoring project implementation, including financial management and coordination of activities. The TE notes that the Ministry of Environment satisfactorily fulfilled its responsibilities (pg. 21). The project did experience moderate

delays at start-up due to problems with the efficiency of the CHP Plant, particularly the gas consumption of the gas turbines and the lower than expected efficiency of the steam turbine (TE pg. 5). A private sector company, Teplarna Kyjov (TPK), was responsible for executing all activities associated with the installation and operation of the CHP Plant. As noted above, the contracts negotiated by TPK for the maintenance of the CHP Plant and the efficiency of the gas turbines were flawed, which affected the operating costs and financial sustainability of the project (TE pg. 17). Ultimately, the time required to implement improvement measures at the CHP Plant resulted in a nine-month extension of the project's timeline (TE pg. 21).

TEPLO KYJOV, a city-owned company, was responsible for the decommissioning of boiler houses and the installation of heat exchangers (project component 5). The TE reports that TEPLO KYJOV performed well during implementation and decommissioned more than the expected number of boiler houses (pg. 22).

8. Assessment of Project Impacts

Note - In instances where information on any impact related topic is not provided in the terminal evaluations, the reviewer should indicate in the relevant sections below that this is indeed the case and identify the information gaps. When providing information on topics related to impact, please cite the page number of the terminal evaluation from where the information is sourced.

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

> The TE notes that the project directly contributed to a reduction of approximately 165,000 tons of CO_2. This calculation was based on the electricity outputs from the CHP Plant, which displaced electricity that would have been produced by more polluting (lignite-fired). Additionally, the replacement of heat boilers with heat exchangers contributed to the reduction in CO_2 emissions (TE pg. 10; 28).

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

> The TE notes that the CHP Plant created sixteen new jobs requiring high levels of education (TE pg. 12).

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. "Capacities" include awareness, knowledge, skills, infrastructure, and environmental monitoring

systems, among others. “Governance” refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities

By project end, a CHP factory was installed at the glass factory with an achieved electric capacity of 19,959.75 kW with a tolerance of +/- 0.493% (TE pg. 9). One new waste heat boiler was also installed at the glass factory; one existing boiler was retrofitted; and one hot water boiler was replaced by a steam boiler (TE pgs. 7-8). Additionally, six kilometers of pre-insulated pipes were installed in the district heating network in Kyjov, along with accompanying instrumentation and control cables (TE pg. 3). 15 gas-fired boilers were also decommissioned and replaced with heat exchangers. Lastly, several new customers in the city were connected with the centralized heating system, including: the Municipal House, the House of Culture, and a primary school building (TE pg. 12).

b) Governance

The TE does not note any changes in governance that occurred by project end.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

The TE does not note any unintended impacts that occurred by project end.

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

The TE does not note any GEF initiatives that had been adopted at scale by project end.

9. Lessons and recommendations

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

The TE provides the following lessons learned (pgs. 22-23):

A major lesson of this Project is of institutional nature: The Kyjov Project was considered interesting by a number of investors and donors for various reasons as follows: enhanced energy efficiency through use of industrial waste heat, improved local environmental performance, reduction of CO_2 from the operation of the Project, market for the sale of gas provider of reliable heat and electricity. The agreement among a group of interested investors whose interests were diverging, to form a joint venture to realize this Project, made efficient Project preparation and implementation possible. The interests of the initial key investors were "bundled" and they reached compromise solutions among each other to realize the interesting Project. It is hoped that during the temporary "crisis" of extremely low power prices in the Czech market, the concept of the joint ownership and joint risk-sharing will prevail and come out in favor of continued full operation of the plant.

All components of the project were implemented according to the Project timetable. Important lessons were learned along the way, particularly by TPK [Teplarna Kyjov]. First, targets of specific gas consumption, estimated by the Project and stipulated in the tum-key contract, could not fully be realized during the trial operation, and TPK had to settle for a higher value because of contractual inconsistencies. Second, technical problems with the waste heat boiler #51 at the glass factory postponed the implementation and start-up of the second waste heat boiler #52, until the technical problems of the first boiler were solved. Lessons learned from boiler #51were fully incorporated in #52.

The resulting higher fuel consumption of gas turbines is not critical to the achievement of the objective to reduce CO_2 emissions, but can lead to higher operating costs and therefore reduced profits than those estimated for the Project.

Technical problems of the waste heat boiler at VMG [the Glass Factory] were not anticipated at the beginning of the Project. Most problems were due to the technological process of glass production at the glass factory that was not within TPK's control. Huge amounts of particulate matter sucked from the glass melting furnace were the most troubling elements because some mechanical parts of the boiler could not work properly with the contaminated air and the boiler had to be cleaned frequently. Gradually this problem was solved. However, it might have been solved earlier if the boiler had been tested properly at the beginning of operation.

The most critical design issue for this type of project is the choice of an optimum electric capacity to install, considering reliability, production costs, and relationship between the heat and electric load served. For the maximum efficiency of cogeneration, the electric generation capacity of CHP plants should be only as large as the available heat load allows. The experience of the Kyjov Waste Heat Utilization Project has demonstrated two important lessons. While these lessons have been derived in the context of the Czech Republic, they are relevant to other countries in transition as well, particularly

when electricity prices are being kept low. The first lesson is that it is difficult for a small independent power producer (IPP) to enter into, and stay within, a long-term contract with the electric grid company if the production cost of the IPP's electricity is not sufficiently competitive. Thus, only if the benefits of cogeneration are high enough due to a sufficiently high heat load, is the operation of such a plant competitive in the liberalizing electricity market. Secondly, the Kyjov project has demonstrated that the existing off-peak (base- and intermediate load) electricity prices in the Czech Republic are currently set at a level to cover variable operating costs for cheap lignite plants, plus a modest allowance for transmission delivery cost. There is little allowance for recapture of investment costs, because the plants are fully depreciated. The existing price structure would thus be improved by a timely increase in the electricity price to recognize that new plants will be required in the future. A decision by the Government to this effect would be a relief to independent power producers, and might help to reopen the gas-fired CHP Plant elsewhere in the Czech Republic which was shut down because of the low power price regime in the country.

9.2 Briefly describe the recommendations given in the terminal evaluation.

The TE does not provide recommendations.

10. Quality of the Terminal Evaluation Report

A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF IEO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The report assesses the completion of project components and the achievement of the global environmental objective (CO_2 emission reduction). However, it does not assess the achievement of development objectives.	**MU**
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	Although the report provides evidence of the completion of project components, it does not ties these components to the development objectives. The report claims the development objectives were achieved, however it does not provide any evidence to substantiate this claim. Ratings are highly inflated.	**MU**
To what extent does the report properly assess project sustainability and/or project exit strategy?	Despite thoroughly detailing key risks to sustainability, the report assigns a rating of Likely, which is substantially inflated.	**MU**
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	Lessons learned are supported by the evidence presented, however they could be streamlined.	**MS**
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The report includes actual project costs and actual co-financing used. However, co-financing figures are not disaggregated.	**MS**
Assess the quality of the report's evaluation of project M&E systems:	The report does not include any information on M&E design or implementation.	**HU**
Overall TE Rating		**MU**[5]

11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

ICR Review (World Bank OEDST, 2002)

Original GEF TER (GEF Secretariat, 2002)

[5] This rating is congruent with the rating provided in the original GEF TER (line 56).