

**Terminal Evaluation**  
**of the**  
**UNEP (United Nations Environment Protection) Project**  
**“Promoting Industrial Energy Efficiency through a Cleaner**  
**Production/Environmental Management System Framework”.**

**Project No: GEF/4020-01-04**

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**May, 2008**

## **Acknowledgement**

*I would like to acknowledge the contribution of numerous project stakeholders and evaluation respondents who received the evaluation mandate as an exercise to freely input their views and provide information in order to create an 'Objective Report' that could serve as a 'Learning Resource' for future projects in the area of Energy Efficiency (EE) and Cleaner Production (CP) framework in project participating countries: Hungary , Slovak Republic, Czech Republic, India, China and Vietnam and many other countries across the world. The evaluation exercise would not have been completed without their proactive support, assistance and value addition.*

*I would like to thank team members at UNEP Evaluation and Oversight Unit: Ms. Cristina Battaglino, Ms. Mercy Mwangi , Ms. Lisa Njonjo and Mr. Segbedzi Norggbey and UNEPDTIE/DGEF team: Mr. Amr M Abdel Hai and Mr. Tom Hamlin for their continued support , encouragement and guidance at all the stages of the evaluation exercise.*

*I would also like to thank UNEP Evaluation & Oversight unit for setting up clear & tangible evaluation goals and all NCPCs for providing the relevant project documentation, logistic support & facilitating the visits to participating SME units and meetings with various stakeholders.*

*All efforts have been made to make the evaluation as 'Objective' as possible. Some 'Subjectivity' however, is inherent in the process of evaluation. The responsibility for unintended adverse observations thus rests with me.*

*Dr. Naval Karrir*

## INDEX

<b>S.NO.</b>	<b>Content</b>	<b>Page.No.</b>
	Executive Summary	6
<b>1.</b>	<b>Project Background and Overview</b>	<b>9</b>
1.1	Baseline conditions at the beginning of the project	12
<b>2.</b>	<b>Terminal Evaluation of the Project</b>	<b>13</b>
2.1	Objective and Scope of the Terminal Evaluation	13
2.2	Evaluation Methodology	13
2.3	Evaluation Principle & Parameters	14
2.4	Limitations of the Evaluation study	14
<b>3.</b>	<b>Project Performance and Impact</b>	<b>15</b>
3.1	Project Performance Evaluation	17
<b>4.</b>	<b>Conclusions</b>	<b>32</b>
4.1	Summary of Project Ratings	33
4.2	Recommendations	34
4.3	Lessons Learnt	35

## Annexes

<b>Annex. No.</b>	<b>Content</b>	<b>Page Nos.</b>
Annex-I	Questionnaire used to collect information from NCPCs	36-41
Annex-II	List of Interviewees	42-44
Annex-III	Terms of Reference for the Assignment	45-52
Annex-IV	Details of Results-MOU-I	53 –Excel Sheet
Annex-V	Details of Results-MOU-II	54-Excel Sheet
Annex-VI	Details of Co-financing	55-56
Annex-VII	Sample Brochure-Case studies	57-60 (PDF File)
Annex-VIII	Evaluation of EE Manual	61-65
Annex-IX	Information collated from PIRs on indicators	66-70
Annex-X	Template-Monitoring Audit Activities	71-72
Annex-XI	Template-Evaluation of EE Manual	73-76
Annex-XII	Template-Achievements of Project	77-79
Annex-XIII	Template-Monitoring consistency of case studies	80-85
Annex-XIV	Financial information	86-148 (PDF File)
Annex-XV	CV of the Evaluator	149

## Abbreviations

CO <sub>2</sub>	Carbon dioxide
CP-EMS	Cleaner Production-Environmental Management System
CPCs	Cleaner Production Centres
EE	Energy Efficiency
ESCOs	Energy Service Companies
GEF	Global Environment Facility
GHG	Green House Gases
MOU	Memorandum of Understanding
M&E	Monitoring and Evaluation
NCPCs	National Cleaner Production Centres
PIR	Project Implementation Review
SMEs	Small and Medium Enterprises
TOR	Terms of Reference
UNEP	United Nations Environment Programme
UNEP-DTIE	Division of Technology, Industry and Economics of UNEP
UNIDO	United Nations Industrial Development Organization

## Executive Summary

The Global Environment Facility (GEF) sponsored the project, titled: Promoting Industrial Energy Efficiency through a Cleaner Production-Environmental Management System (CP-EMS) framework with an objective to reduce emission of Green House Gases (GHGs) in Small & Medium Enterprises (SMEs) in six countries - China, India, Vietnam, Czech Republic, Hungary and Slovak Republic.

The project was managed and executed by: United Nations Environment Protection-Division of Technology, Industry and Economics (UNEP-DTIE) together with the National Cleaner Production Centres/Cleaner Production Centres (NCPCs/CPCs) operation in the aforementioned six countries.

The envisaged project duration of 20 months starting in February 2002 was revised to be completed in June 2007.

At the beginning of the project, all six project participating countries had existing NCPCs, established with government support and operating under a UNEP/UNIDO (United Nations Industrial Development Organization) framework.

The expected outcome from the project was to integrate Energy Efficiency concepts into CP (Cleaner Production) approaches and train/develop CP professionals working in the existing UNEP/UNIDO network of NCPCs.

### Cost of the Project

US\$ 2,715,000 (break up provided below- as per project document)

	US\$	%
1. Cost to the GEF Trust Fund	950,000	35.0
2. Co-financing (in-kind):		
UNEP	175,000	6.4
NCPCs	600,000	22.1
Industry	990,000	36.5

### Terminal Evaluation of the Project

The Terminal Evaluation of the project was carried out during the period November 1, 2007 to February 2, 2008, for a total duration of 40 days using a participatory approach whereby the UNEP/DTIE Project Coordinator & NCPCs were kept informed and regularly consulted throughout the evaluation.

The objectives of the terminal evaluation were to:

- Determine the extent to which the project objectives have been achieved;
- Assess if the project has led to any positive or negative consequences; and
- Assess project performance (implementation of planned project activities and outputs against actual results).

The limitation of the Terminal Evaluation included:

1. The evaluation was limited due to resource constraints on evaluation time & budgets.
2. There were serious constraints in terms of the information made available on project design and implementation.

Hence, the evaluation report needs to be considered in light of the above-mentioned constraints.

### **Project Performance**

- The project has led to positive consequences in terms of integrating the Energy Efficiency (EE) and Cleaner Production (CP) practices in the SMEs, leading to reduction in the emission of green house gases in all the six project participating countries (i.e., Hungary, Slovak Republic, Czech Republic, India, Vietnam and China).
- The project's main objective of reducing the emission of carbon dioxide by 225,000 tons/year by improving energy management practices and identifying investments in SMEs through a structured approach has been achieved to an extent that, to date, 219,000 tons/year CO<sub>2</sub> equivalent emission reduction have been reported by UNEP-DTIE from the measures undertaken by the participating SME units based on the implementation of the CP-EMS audit recommendations.
- Against the planned target of 90 audits to be conducted by participating NCPCs, the project has been able to conduct 87 audits.
- With regards to the number of proposals prepared and submitted to financing institutions the target was 90 proposals. However, the desk review of the audit reports and the feedback received from SME units (visited during evaluation mission) has revealed that the audit recommendations were in the areas of: good house keeping measures, process control, equipment modifications, equipment & material change and recycle & reuse. The recommendations were either low cost or no cost measures for which the financing was done in-house by the SMEs without submitting proposals to the financial institutions.
- All the six participating NCPCs successfully translated and adapted the Energy Audit Manual available in English to the national conditions/languages.
- The project targeted training 18 persons across six NCPCs to become capable of managing/conducting energy efficiency audits in industry as part of a Cleaner Production/EMS program. The project far exceeded the target by making 126 persons across six NCPCs, capable of managing/conducting energy efficiency audits in the industry. Further capacities were developed among NCPC personnel to use GHG indicator software available in the public domain.
- As part of the project objectives, awareness has been created amongst professionals in the global network of NCPCs and other in-country stakeholders (e.g., Energy Managers Associations and Business Councils) on methods for providing energy management services.

## **Conclusions**

Based on the discussions with various stakeholders during the evaluation, it has been observed that the project has been able to create awareness and build capacities on the EE–CP integration amongst them.

Furthermore, as per the information provided by UNEP-DTIE ,it can be concluded that the project has succeeded in meeting its objective to reduce emission of Green House Gases (GHGs) by identifying and implementing Energy Efficiency (EE) improvements as an integral part of CP-EM audits in Small & Medium Enterprises (SMEs) in six countries.

There have been revisions in the timelines and budgets allocations. However, despite all the revisions the total cost of the project to the GEF Trust Funds and co-financing has remained unchanged.

Considering the foresaid and the fact that the project was in SMEs in six different countries across two continents the overall rating of the project is evaluated as ‘Satisfactory’.

## 1. Project Background and Overview

The Global Environment Facility (GEF) within its focal area of Climate Change (CC) and Operational Program (OP 5-Removal of barriers to energy efficiency), sponsored the project, titled: Promoting Industrial Energy Efficiency through a Cleaner Production-Environmental Management System (CP-EMS) framework, in six countries: China, India, Vietnam, Czech Republic, Hungary and Slovak Republic.

The **overall goal of the project** was to reduce emission of Green House Gases (GHGs) by identifying and implementing Energy Efficiency (EE) improvement as an integral part of CP-EMS audits in Small & Medium Enterprises (SMEs) in six countries.

The project **Management & Executing Agencies** were: United Nations Environment Programme - Division of Technology, Industry and Economics (UNEP-DTIE) together with the National Cleaner Production Centres/Cleaner Production Centres (NCPCs/CPCs) operation in the aforementioned six countries, and referred in this terminal evaluation report as NCPCs.

The project complemented well with other GEF efforts in the six countries, including Energy Conservation & Pollution Control in Township and Village Enterprise Industries (China); Energy Efficiency Co-Financing Program (Hungary); Efficient Industrial Boilers (China); China Energy Conservation Project (China); Efficient Lighting Initiative (Czech Republic and Hungary); and Energy Efficiency (India).

The envisaged project duration was 20 months starting in February 2002, which was later revised and extended to be completed in June 2007, making the total project duration of 63 months. Six project revisions were undertaken during the project period, details on the revisions and the reasons therein included in the subsequent sections.

Before the start of the project, all the six project participating countries had realized the need for improving industrial energy efficiency in their national environmental policies and programs.

- The Czech Republic addressed the need to improve energy efficiency through a Governmental Decree 252 (1991) and mentioned the importance of energy conservation explicitly in its State Environment Policy.
- The Slovak Republic revised its National Energy Policy in 1999; the policy recommended “optimization of state support to rationalization of energy use and minimization of energy consumption”.
- India had since mid-1970s’ emphasized the need to improve industrial energy efficiency and started a number of government programs that supported investments in energy efficiency improvements and cleaner production. Organizations like National Productivity Council (NPC) and Petroleum Conservation Research Association (PCRA) were mandated to create awareness about the need and salience of energy efficiency and cleaner production in the industrial sector.

- China established a National Energy Conservation Information Centre and started investigating how enterprises interested in environmental management system certification (particularly ISO14001) could be linked to energy conservation.
- Hungary and Vietnam similarly made energy efficiency in industrial sector a national priority.

At the beginning of the project, all six project participating countries had existing National Cleaner Production Centres (NCPCs) established with government support and operating under a UNEP/UNIDO (United Nations Industrial Development Organization) framework.

Currently, in China the National Cleaner Production Centre (NCPC) is attached to the State Environmental Protection Agency (SEPA), while India's centre is supported institutionally by the National Productivity Council (NPC), a semi-autonomous body affiliated with the Ministry of Industry, well known for its expertise in energy management. The Vietnamese Cleaner Production Centre is supported by the Ministry of Planning & Investment and the Ministry of Science, Technology & Environment, while the Deputy Minister of Industry and Environment sits on the Czech Centre's Steering Committee to ensure coordination with Government policies and programs.

In Slovakia, the Cleaner Production Centre is constituted as an NGO, but has government officials on its Steering Committee. The Hungarian Cleaner Production Centre has departmental status within the Department of Environmental Economics and Technology in the Faculty of Business Administration, Budapest University of Economic Science and Public Administration, Hungary which is a government institution.

The current project proposed to respond to specific needs of industry (as identified by NCPCs in their work) particularly the Small and Medium Enterprises (SMEs). Further, the project proposed to promote in industry a CP-EMS approach that could include fostering best energy management practices and investments that could reduce emissions of the Green House Gases (GHG).

The main **Components of the project (as per project document)** included:

- 1) Undertaking energy audits by the participating NCPCs in the industrial SMEs.
- 2) For each audit, development of at least one investment proposal for equipment with improved Energy Efficiency (EE).
- 3) Preparation of national versions of an energy audit manual from a CP-EMS perspective. The core Energy Audit (EA) manual had already been produced (in English) as a joint UNEP (United Nations Environment Protection)/UNIDO (United Nations Industrial Development Organization) activity.
- 4) Training of personnel in the six NCPCs capable of conducting energy audits as an integral part of a CP-EMS audit.
- 5) Increasing the awareness of personnel in the global network of NCPCs and other in-country stakeholders (e.g., Energy Management Associations and Business Councils) for opportunities that EMS can provide, if integrated into the NCPC business advisory practices and methods for doing so.

The Overall **Expected Outcome** from the project was: to integrate EE concepts into CP approaches and train/develop CP professionals working in the existing UNEP/UNIDO network of NCPCs.

As per the project document, the expected *direct outcomes of the project* included:

- an estimated annual reduction of 225,000 tons of CO<sub>2</sub> (carbon dioxide-a GHG) equivalent;
- at least 15 energy audits conducted by each of the six participating NCPCs (a total of 90 audits);
- developing financing proposals (an average of one proposal per audit: a total of 90 proposals) for medium-cost energy efficiency investments and assistance in negotiating with multilateral/bilateral as well as local financial institutions;
- national versions of the UNEP/UNIDO CP-Energy Audit manual that could specifically be integrated with the CP and EMS materials already being used by the six NCPCs. Particular attention to be given to the integration of information on procedures relating to (i) the environmental aspects of how energy is used in the various energy systems in SMEs and (ii) to include energy–environment links of energy systems or guidelines for selecting energy saving alternatives based on environment conservation aspects, into the manual;
- trained personnel in the six NCPCs capable of conducting an energy audit, either as stand alone activity or as part of CP-EMS audit; and
- personnel in the remaining NCPCs in the global network and other in-country stakeholders, such as Energy Managers Associations and Business Councils, to have increased awareness on the opportunities and methods for integrating EMS in their operations.

The expected *long-term project outputs* included:

- continued delivery of services by participating NCPCs to their private sector clients on CP-EMS advisory and training with an energy efficiency component;
- improved co-ordination and links between the NCPCs and on-going related project managers (such as existing ESCOs, Energy Manager Associations and Business Councils) on energy auditing;
- increased levels of identification and implementation of EE measures by the industrial enterprises and thus continued contribution to GHG emission reductions; and
- expansion of the approach to the other NCPCs and NCPC-like institutions operating in the UNEP/UNIDO Network.

**Cost of the Project:**

	US\$	%
1. Cost to the GEF Trust Fund	950,000	35.0
2. Co-financing (in-kind):		
UNEP	175,000	6.4
NCPCs	600,000	22.1
Industry	990,000	36.5
<b>Total Cost</b>	<b>2,715,000</b>	<b>100.0</b>

## **1.1 Baseline Conditions at the Beginning of the Project (as per project document)**

SMEs are an important industrial segment in all developing countries, both in terms of their contribution to the national economy and in their share of industrial energy consumption. Most of the SMEs in the project participating countries use outdated manufacturing technologies for example: Lancashire boilers for steam generation, winches and jiggers in textile processing, box type forging furnaces, and down draft kilns in the ceramic industry. Consequently, SMEs in the project countries tend to use far more energy per unit output than their counterparts in the developed countries.

Lack of information and skilled personnel are significant barriers for the SMEs to undertake energy efficiency measures on their own. A typical SME entrepreneur, saddled with the problem of too many functional pressures and too little time, finds it difficult to cope with the demands of different government agencies regarding energy, environment, safety, workers' health, and similar non-production issues. The result is often an aversion to change unless forced by regulation or some other external pressure.

Prevailing approaches to improving energy efficiency in SMEs have mostly been task oriented and prescriptive in nature, and have thus become external to the day-to-day business management. Quite often, an energy efficiency improvement program ends as soon as the energy efficiency advisor moves out of the factory. Consequently, energy efficiency programs have mostly remained sporadic and of short duration. Energy efficiency programs are mostly based on the economic attractiveness of reduced energy consumption. With declining energy prices this attraction has also declined. In a parallel, CP-EMS programs have been mainly environment-driven and generate little interest, where environmental issues are not sensitive or important.

Professionals with skills in the fields of energy efficiency and CP-EMS find themselves in separate compartments. Although the energy-environment linkage is well recognized, its complementary nature is rarely exploited. Integrating EE-CP-EMS would create an approach that is stronger than its parts.

In summary, combining energy efficiency with environmental management in a systematic manner would have greater appeal to industrial entrepreneurs and the managers in SMEs.

## 2. Terminal Evaluation of the Project

The Terminal Evaluation of the project was carried out during the period November 1, 2007 to February 2, 2008, for a total duration of 40 days that included 26 days of travel to the six project participating countries and 14 days of desk work.

The NCPCs in the project countries coordinated the project evaluation visits in the participating SMEs and organized the meetings with various project stakeholders. In India, China and Slovak Republic industrial visits could not be coordinated by the NCPCs and telephonic interviews were held. In Hungary, Czech Republic and Vietnam two industrial units each were visited to solicit feedback on the project implementation and recommendations for the future projects.

### 2.1. Objective and Scope of the Terminal Evaluation

The *objectives of the terminal evaluation* were to:

- Determine the extent to which the project objectives have been achieved;
- Assess if the project has led to any positive or negative consequences; and
- Assess project performance (implementation of planned project activities and outputs against actual results).

The evaluation has primarily focused on the following *main questions* (as per the *Terms of Reference {TOR}*):

- To what extent has the project improved the promotion of Green House Gases (GHG) emission reductions by removing barriers that prevent the integration of EE improvements and energy management practices with general environmental management approaches?
- To what extent has the project been able to build capacities and increase the implementation of energy efficiency initiatives in the SMEs?
- To what extent has the project been able to create a structured energy audit methodology and management approach consistent with related concepts such as EMS-CP?

In other words, the evaluation has assessed how effective was the development and application of an integrated energy-environment management approach through the CP-EMS route, which aimed at an overall improvement in the environmental performance of the enterprises.

### 2.2. Evaluation Methodology

An in-depth evaluation was conducted using a participatory approach whereby the UNEP/DTIE Project Coordinator & NCPCs were kept informed and regularly consulted throughout the evaluation.

The evaluation utilized the following *methodology*:

1. A *desk review* of project documents including:
  - (a) Energy Audit reports, project summaries, project revision reports, annual Project Implementation Reviews (PIRs) and relevant correspondence amongst various project stakeholders;
  - (b) Notes from the bilateral meetings between UNEP-DTIE & NCPCs, training/workshop proceedings and other correspondence related to the project with various stakeholders;
  - (c) The review of Energy Audit Manual developed and subsequently adapted by NCPCs to suit local conditions, CDROM and websites/portals created by NCPCs; and
  - (d) Other project material produced by the NCPCs (Example: case references and dissemination material on EE & CP activities).
2. Structured *Questionnaire* was used to solicit information from NCPCs (Please see Annex I for the questionnaire).
3. *Interviews* were held with the directors & staff of each participating NCPC in six participating countries.
4. *Interviews* with the officials of the Energy Branch UNEP-DTIE: Project Coordinator and Task Manager. Interviews (face to face, email and telephone) were held with various project stakeholders in the six project participating countries were held. The list of interviewees (including the directors & staff of each participating NCPC) is included in **Annex II**.
5. *Interviews* with Project Manager & Project Coordinator, UNEP were also held.
6. *Site visits* were undertaken to the six NCPCs in the participating countries.

### **2.3. Evaluation Principle & Parameters**

The key evaluation principle followed for the assessment of this project (as per TOR) focused on the following questions: “what happened?” and “what would have happened anyway?” The key underlying consideration was the ‘Baseline conditions’ that existed before the project implementation in the project participating countries and how these baselines got changed with the project interventions.

The evaluation parameters followed the requirements of the TOR specified by UNEP Evaluation & Oversight Unit, for this assignment, (see **Annex III** for the TORs).

### **2.4. Limitations of the Evaluation Study**

1. The evaluation was limited due to resource constraints on evaluation time & budgets.
2. There were serious constraints in terms of the information made available on project design and implementation.

Hence, the evaluation report needs to be considered in light of the above mentioned constraints.

### 3. Project Performance and Impact

As per the results planned under the Memorandum of Understanding (MOU)–I signed in March 2002, between UNEP–DTIE and NCPCs a total of 45 audits were planned and conducted: Vietnam (7), China (10), India (10), Hungary (7), Slovak Republic (7) and Czech Republic (4).

A summary of the results achieved (as per documents submitted by UNEP-DTIE) are provided in table 1 below. (For details see **Annex IV**). Please note that the information could not be verified during evaluation.

**Table 1. Project Overall Achievements as per MOU-I**

<b>Countries (audits)</b>	<b>Vietnam (7)</b>	<b>China (10)</b>	<b>India (10)</b>	<b>Hungary (7)</b>	<b>Slovak (7)</b>	<b>Czech (4)</b>	<b>Totals</b>
Total Savings from the implemented measures (USD/year)	1,714,525	831,609	2,916,068	130,111	94,095	23,400	<b>5,709,808</b>
Total Investment from the implemented measures (USD)	428,199	985,609	5,115,952	352,495	223,790	62,200	<b>7,168,245</b>
GHG Reduction from the Identified measures (ton/year)	29,558.92	30,655.10	114,389	1,716.8	6,532	341	<b>183,192.82</b>
GHG Reduction from the implemented measures (ton/year)	20,102.92	10,431.80	71,835.3	622.80	6564	341	<b>109,897.82</b>
No. of professionals trained in the NCPCs/ CPCs capable of conducting CP-EE audits.	8	4	40	2	5	3 (with additional external consultants)	<b>62</b>
No. of professionals trained in the NCPC/ CPC capable of using the GHG indicator software.	3	6	40	2	4	2	<b>57</b>

Source: UNEP-DTIE

As per the results planned under the MOU–II signed in June 2003, between UNEP-DTIE and NCPCs a total of 42 audits were planned: Vietnam (10), China (10), India (5), Hungary (7), Slovak Republic (10) and Czech Republic (0). There was a change of NCPC administration in Czech Republic which interrupted the continuation of the project in this country. The summary of the results achieved (as per documents submitted by UNEP-DTIE) are provided in table 2 below. For details please see **Annex V**. Please note that the information could not be verified during evaluation.

**Table 2. Project Overall Achievements as per MOU-II**

<b>Countries (audits)</b>	<b>Vietnam (10)</b>	<b>China (10)</b>	<b>India (5)</b>	<b>Hungary (7)</b>	<b>Slovak (10)</b>	<b>Czech</b>	<b>Totals</b>
Total Savings from the implemented measures <b>(USD/year)</b>	172,157	28,212,761	28,384,918	255,501	167,918	NIL	<b>\$57,193,255</b>
Total Investment from the implemented measures <b>(USD)</b>	111,877	6,199,756.00	6,311,633	1,708,700	1,584,730	NIL	<b>\$15,916,696</b>
GHG Reduction from the Identified measures <b>(ton/year)</b>	9,195.86	78,629.60	87,825.46	4,838	7,609	NIL	<b>188097.920</b>
GHG Reduction from the implemented measures <b>(ton/year)</b>	3,319.45	45,633	48,952.45	3,240	7,609	NIL	<b>108753.900</b>
No. of professionals in the NCPCs/ CPCs capable of conducting CP-EE audits.	8	9	40	2	5	NIL	<b>64</b>
No. of professionals in the NCPCs/ CPCs capable of using the GHG indicator software.	3	13	40	2	4	NIL	<b>62</b>

Source: UNEP-DTIE

### 3.1. Project Performance Evaluation

#### A. Project Performance

##### a) *Integration of Energy Efficiency (EE) and Cleaner Production (CP) practices in the SMEs*

- The project has led to positive *consequences* in terms of integrating the Energy Efficiency (EE) and Cleaner Production (CP) practices in the SMEs, leading to reduction in the emission of green house gases in all the six project participating countries.
- The project's main objective of reducing the emission of carbon dioxide by 225,000 tons/year by improving energy management practices and identifying investments in SMEs through a structured approach has been achieved to an extent that, to date, 219,000 tons/year of CO<sub>2</sub> (Carbon dioxide) equivalent emission reduction have been reported by UNEP-DTIE, from the conducted audits and measures being undertaken. This is a good achievement considering the fact that the second MOU for conducting audits in Czech Republic SMEs was not signed as the new NCPC's mandate (established in early 2005) was mainly on dissemination of information on energy efficiency–cleaner production in generic terms without going into making specific recommendations based on audits in the units.
- Against the planned target of 90 audits to be conducted by participating NCPCs, the project has been able to conduct 87 audits.
- With regards to the number of proposals prepared and submitted to financing institutions the target was 90 proposals. However, the desk review of the audits reports and the feedback received from SME units (visited during the evaluation mission) has revealed that, the audit recommendations were in the areas of: good house keeping measures, process control, equipment modifications, equipment & material change and recycle & reuse. The recommendations were either low cost or no cost measures. The implementation of the recommendations was done by the units without approaching the financial institutions for loans. Formal financing proposals were either not prepared or submitted to financial institutions.

##### b) *Capacity building activities*

- The project targeted *training* 18 persons across six NCPCs to become capable of managing/conducting energy efficiency audits in industry as part of a Cleaner Production/EMS program. The project far exceeded the target by making 126 persons across six NCPCs capable of managing/conducting energy efficiency audits in the industry. Further capacities have been developed within the NCPCs enabling them to use GHG indicator software available in the public domain.
- The project trained the industries as well as the six NCPCs to carry-out CP-EMS audits. As part of the project, UNEP-DTIE and the National Productivity Council (NPC, India) organized and conducted in India in February 2002, a two-tier training program:

- 1) A three day basic training for the NCPC directors, followed by
  - 2) An intensive two week training for two/three CP expert from each NCPC on issues related to CP-EMS.
- Furthermore, a project Intranet Site was created to submit the CP-EMS audits and share the related information and tools among project participating NCPCs during the duration of the project. This intranet site no longer exists as it was only meant to be a means of exchanging information and documents between project partners during the project implementation.
  - The project also planned to create awareness amongst professionals belonging to the global NCPC network and other in-country stakeholders (e.g., Energy Management Associations and Business Councils) on methods for providing CP-EMS services. For this purpose, a “Latin American Dissemination Meeting” for the UNEP-GEF Cleaner Production (CP)-Energy Efficiency (EE) project was conducted in Mexico, wherein 43 representatives from the global network of NCPCs attended and participated. The representatives came from the following countries: Argentina, Colombia, Brazil, Guatemala, Mexico, Nicaragua, Ecuador and Peru. In addition to the above, representatives from the six project participating NCPCs also participated in the same meeting.
  - Furthermore, a 10 day "Cleaner Production and Energy Efficiency Training Program" was conducted for NCPCs from Africa and Latin America (in January 2005). The training included presentations, technical training exercises & real case studies using tools from the CP-EE manual. The training helped the participating Cleaner Production Centres, from Africa and Latin America, to learn about integration of energy efficiency concepts into CP approaches, and to include energy efficiency activities as a comprehensive part of their ongoing core programs and activities.
  - Nine “Business Cases Brochures” containing information on EMS methods that can be used as case references in the UNEP Industry bulletins were published. These publications were based on the energy audit studies conducted in the SMEs and fostered the integration of CP-EE approach/methodology. New MoUs were finalized and signed with India, China and Vietnam NCPCs for conducting and producing outreach activities and materials to widely promote the CP-EE approach and methodology.

**c) *Transformation of the Policy Frameworks at the Local/National/International Levels:***

The project has led to the creation of awareness on the need and importance of integrating the EE & CP activities in the SME sectors in the participating SMEs in all the project countries.

As per NCPCs in India, Vietnam and China, they have provided expert advice to various government bodies in the formulation of national policies and frameworks on the EE & CP practices. However, it cannot be concluded with confidence (due to lack of correlated evidence) that the project has created a significant transformational effect on the policy frameworks.

**d) Project results in terms of quantification of the energy saved, investments made and the Green House Gases reduced:**

The information was collected and collated from the project documentations, interviews with NCPCs, the project coordinator and SMEs in the six participating countries. As per the information provided by UNEP-DTIE, the summary of the energy saved, investments made and the Green House Gases reduced is presented in the tables above in section 3.0 (details available in **Annex IV & V**).

Considering all of the above stated, the overall rating of the project on attainment of project objectives and results is 'Satisfactory'.

**B. Assessment of Sustainability of Project Outcomes**

The sustainability of the project outcomes has been evaluated on the following three aspects (as per TOR) in terms of the persistence of the project impacts after the project funding ends.

**a) Financial:** As per details made available by UNEP-DTIE, the support provided by the participating units on the project of US\$ 3,722,000 (refer **Annex VI**) has been 'in kind' in terms of the professional resources made available to NCPC personnel for undertaking the 87 EE & CP audits during the project period. In absence of correlated evidence, the information could not be validated.

During the evaluation visits to participating SMEs (names of enterprises provided in **Annex II**) in Hungary, Slovak Republic and Vietnam the evaluator found that the enterprises have created their own dedicated teams to carry out audits and implementing the recommendations on EE & CP activities on a regular basis.

Further, the discussion with NCPC personnel during the evaluation visits has revealed that the NCPCs in all the participating countries except Hungary and Czech Republic (new CPC) are using the experience gained from the project to conduct EE-CP audits in the SMEs on a chargeable basis, hence sustaining the project initiative beyond project funding.

**b) Socio-Political:** Considering the facts: the project has been able to conduct 87 EE-CP audits against a target of 90, able to achieve an estimated 219,000 tons CO<sub>2</sub> equivalent emission reduction against the target of 225,000 tons of CO<sub>2</sub> equivalent and trained a number of NCPC personnel far exceeding the target, leads to a conclusion that the project has been able to create significant awareness about EE-CP benefits in the participating SMEs. This would lead to higher implementation of EE&CP policies crafted by the government and to a subsequent reduction in GHG emissions.

Furthermore, an enabling environment has been created for sustainability of EE-CP measures propagated by the project in all the participating countries due to increased energy prices and the rising concern for Green House Gases (GHG) reduction.

**c) Institutional Framework and Governance:** at the national level, in all the participating countries policy frameworks (environmental laws and/or conducting of compulsory EE-CP audits) have been created to foster energy efficiency and cleaner production. Moreover, many institutions have also been mandated to carry the energy efficiency and cleaner production agenda forward. However, these may not be

considered as a direct consequence of this project, due to lack of correlated evidence.

### **C. Achievement of Outputs & Activities**

As per requirements of the TOR, the assessment of the project with respect to achievements of output and activities has been summarized as an answer to the following questions:

- a) *Has the Project supported NCPCs in acquiring technical knowledge on EE and its integration to CP? and*
- b) *Has the project supported the private sector in understanding EE-CP methodologies?*

Yes. As per discussions with the NCPCs during the evaluation, the project has extended support to them in acquiring technical knowledge and its integration to CP practices. Furthermore, as per the details provided in section 3.1(capacity building activities), the project targeted **training** 18 persons across six NCPCs to become capable of managing/conducting energy efficiency audits in industries as part of a CP-EMS program. Based on the information provided by UNEP-DTIE, the project has exceeded the target by making 126 persons across six NCPCs capable of managing/conducting CP-EMS audits. Also, capacities of NCPCs were developed to enable the use of a GHG indicator software available in the public domain. For details see **Annexes IV & V**.

With regards to the support provided to the private sector towards understanding EE methodologies, the NCPCs have created awareness & developed skills in EE-CP methodologies by:

- i) Conducting 87 EE-CP audits in the participating SME units in six participating countries, and
- ii) Development and dissemination of “Business Case Brochures” in India, China and Vietnam which depict the integrated CP-EE approach/methodology based on the CP-EE audits conducted .The Business Case studies included following industrial sectors: Metal Finishing, Textile, Rayon, Pulp and Paper, Fertilizers, Brewery and Hotel sectors (for a sample of a brochure see **Annex VII**).

The Case Studies/Brochures have supported the CP-EE Project’s strategic plan by:

- Providing effective & articulated core message that describes the CP-EE approach/methodology and the value it brings to industrial enterprises.
- Creating for NCPC staff a clear and lasting core message to communicate with industries.
- Ensuring that the project outcomes are consistently illustrated through the message platform, promotional material, and awareness campaigns.
- Connecting SME efforts and core programs of the NCPCs activities.
- Motivating and building capacity of NCPC staff to consistently communicate the benefits of the CP-EE approach to key stakeholder
- Engaging more industrial enterprises by generating enthusiasm, greater attention and commitment to implement the CP-EE audits.

- c) *Has the project supported and developed investment proposals for equipment with improvement in EE amongst the participating units?*

Yes, to a certain extent. The SMEs in all the participating countries did go through the EE and CP audit activities under the project and also followed up on the implementation of the recommendations made in the audit reports. The bulk of the recommendations were in the areas of housekeeping and retrofit measures seeking either low or no investments.

Moreover, in many participating SMEs, there existed a policy - to implement the recommendations made on EE/CP activities through internal resources rather than going to banks and Financial Institutions (FIs). Hence, the recommendations of the audits were implemented by the participating industries using their own resources, without necessarily going through the process of developing formal investment proposals to be financed by the banks and financial institutions. No investment proposals were submitted to financial institutions for availing loans to implement recommendations of EE-CP audit recommendations.

- d) *Has the project developed and translated an Energy Audit manual adapted to the CP perspective?*

Yes. UNEP-DTIE has developed an Energy Audit manual adapted to the CP perspective. It is a very comprehensive, easy to understand manual that can be practically used by SMEs to conduct self-audits and prepare programs for the implementation of EE-CP measures.

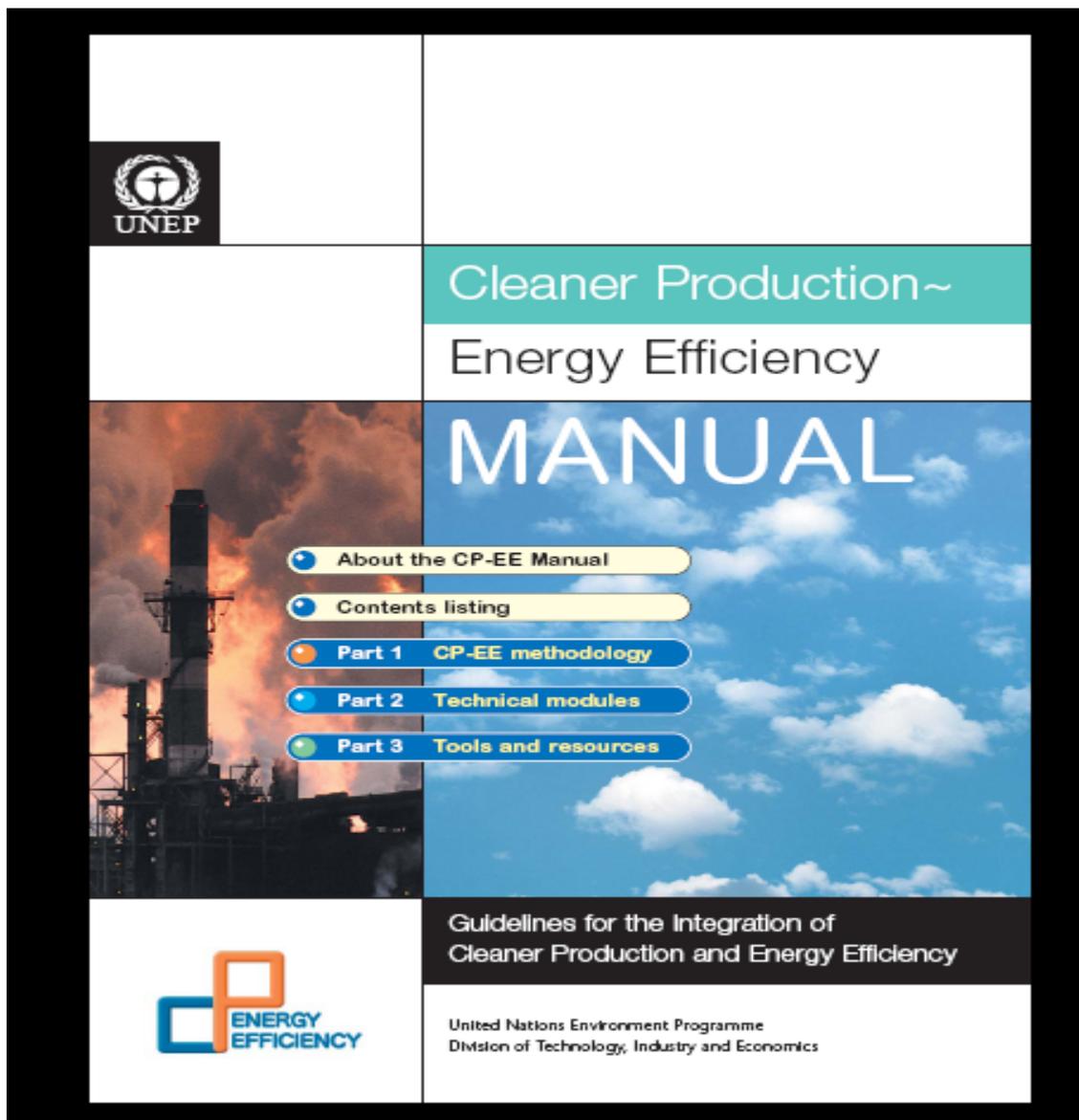
For brief evaluation of the EE Manual see **Annex VIII**.

As per discussions with UNEP-DTIE, the number of NCPCs and private companies using the CP-EE manual has been increasing. The six participating NCPCs translated the manual (adapting it to the local needs of the SMEs) to the respective national languages (India adapted the manual in English as this being one of the national languages).

Two hundred copies of the publication have been distributed among NCPCs and related organizations in the private sector. Positive feedbacks have been received from the units/industrial facilities confirming the active use of the manual in their daily work.

Furthermore, based on the core manual prepared at the start of the project, an enhanced CP-EE manual (cover snap shot provided below) has been developed by UNEP-DTIE and India NCPC (available on CD-ROM and as downloadable version on the project web site: <http://www.unep.fr/energy/projects/cp-ee/manual.htm>). The enhanced manual is now being used by other Centres within the NCPC global network to replicate the CP-EE approach. This is one of the significant achievements of the project.

**Figure 1: CP-EE Enhanced Manual Developed by the Project (Cover Page)**



e) *Has the project established knowledge exchange networks with NCPCs and others not participating in the project?*

According to UNEP-DTIE, the project was successful in establishing knowledge exchange networks amongst the participating NCPCs during the duration of the project. Under the project, an intranet site was created to submit the CP-EE audits and share CP –EE related information & tools among the NCPCs.

For other NCPCs not participating in the project, a “Latin America Dissemination Meeting” for the UNEP-GEF CP-EE project was conducted in Mexico, wherein 43 representatives from the global network of NCPCs attended. The representatives came from the following Latin American countries: Argentina, Colombia, Brazil,

Guatemala, Mexico, Nicaragua, Ecuador and Peru. The six NCPCs participating in this project also attended the meeting.

Furthermore, a 10-day "Cleaner Production and Energy Efficiency Training Program" was conducted for NCPCs from Africa and Latin America in January 2005. The training, designed on the concept of "Train-the-Trainer", was hosted by InWent (Capacity Building International) in Feldafing, Germany from 24-28 January 2005. Nine national trainees, from NCPCs in Latin America and Africa, attended the training from the following countries: Costa Rica, El Salvador, Guatemala, Kenya, Mexico, South Africa, Morocco and Mozambique. As a compulsory follow-up activity, participants of the course were then obliged to conduct at least one CP+EE training activity in their respective countries.

The training included presentations, technical training exercises and real case studies and tools from the CP-EE manual. The training helped the participating Cleaner Production Centres from Africa and Latin America, to learn about integration of energy efficiency concepts into CP approaches and to include energy efficiency activities as a comprehensive part of their ongoing core programs and activities

f) *To what extent have policy makers been sensitized in the EE-CP approach?*

The NCPCs participating in the project are either attached to the Government agencies or supported by them. Furthermore, NCPCs have been participating in various forums in which policy makers discussed and formulated initiatives on energy efficiency and cleaner production. During the discussions with NCPCs, it was also revealed that they have been conducting training programs, seminars, workshops in the area of cleaner production and energy efficiency, in which policy makers have also participated.

Although in the project participating countries, policies at national/regional levels have emerged that foster energy efficiency and cleaner production, in absence of correlated evidence, it cannot be said that the project has directly contributed towards the formulation of these policies at the national level.

At the participating SME unit level, the policy makers have been sensitized in all the participating units to undertake energy efficiency and cleaner production. This may have indirectly sensitized policy makers at the national level in the project countries.

g) *How have the project countries and others benefited as a direct/indirect result of the project?*

The direct and indirect benefits from the project have been the following (see **Annex IV & V** for details):

- an annual emission reduction of 219,000 tons of carbon dioxide equivalent;
- Total energy savings to the tune of US \$ 23,084,941 has been achieved;
- 126 professionals trained on EE-CP activities under the project;
- The creation of EE manual, its translation and adaptation to the local conditions in the six participating countries has created awareness on the benefits that can accrue as a result of EE-CP audit implementation; and

- The project may have influenced the formation of the policies fostering energy efficiency and cleaner production in the SME sectors in the participating countries.

*h) To what extent have the specific needs of the target group of stakeholders been considered in the design process and recommendations?*

As per discussions with UNEP-DTIE, the project proposal was prepared by UNEP-DTIE in consultation with the following NCPCs:

- China National Cleaner Production Centre, Beijing, China;
- Czech Cleaner Production Centre, Prague, Czech Republic;
- National Cleaner production Centre of Hungary, Budapest, Hungary;
- Indian National Cleaner Production Centre, New Delhi, India;
- Slovak Cleaner Production Centre, Bratislava, Slovak Republic; and
- Vietnam Cleaner Production Centre, Hanoi, Vietnam.

Furthermore, as per the project document, the project proposed to respond to the specific information needs of SMEs as identified by the NCPCs in their work. Hence, it can be considered that the project did consider the specific needs of the target group of stakeholders into consideration at the design stage. However, in absence of the records/information available on the specific recommendations from various stakeholders at the design stage, the evaluator has not been able to record the extent of inclusions.

## **D. Monitoring and Evaluation (M&E)**

### **M&E Design**

During discussions with UNEP-DTIE, it has been revealed that GEF did not require M&E plans at the time of project approval. Hence, ‘Log Frames’ were not negotiated with GEF and the M&E protocol was not included as part of the project design. UNEP-DTIE focused efforts on M&E as the project matured & progressed.

Based on the discussions with UNEP-DTIE and review of the project document, it has been observed that the project adopted the following success indicators as part of its M&E activities:

- a) Number of audits conducted by participating NCPCs (target: 90 audits).
- b) Number of proposals prepared and submitted to financing institutions (target: 90 proposals).
- c) Energy Audit Manual available in English and adapted to six national conditions/languages.
- d) Number of professionals in the NCPCs capable of managing/conducting energy efficiency audits in industry as part of a CP-EMS program (target: 18 persons).
- e) Number of professionals in the global network of NCPCs and other in-country stakeholders (e.g., Energy Managers Association(s) and Business Councils) aware of methods for providing EMS (target: global network of NCPCs).

- f) Published articles on EMS methods that NCPCs` can adopt in their bulletins and other information dissemination channels.

However, the means of verifying these success indicators were not described in the project document.

### **M&E Plan Implementation**

As per discussions with UNEP-DTIE, the Division evaluated the progress of the project on the above mentioned indicators as the project progressed, specifically when the PIRs were conducted.

For the information collated from the final PIR on the project review (based on the indicators) see **Annex IX**. In addition, UNEP-DTIE used **templates** for:

- monitoring the audit activities in the participating SMEs (**Annex X**).
- evaluating and receiving feedback on the energy efficiency manual from SME units and personnel trained from NCPCs ( **Annex XI**).
- recording the achievement of the projects (**Annex XII**).
- monitoring the consistency and quality of information provided in the case studies (**Annex XIII**).

Furthermore, sample verification was performed by the project coordinator in six SMEs in India, China, Vietnam and Hungary at the end of the project. The objective of the verification was to have an independent and objective review of the CP-EE assessments conducted by the NCPCs in the six SMEs.

The project did not constitute a Steering Committee to review the project implementation. Therefore, in the absence of a structured M&E approach adopted for the project, the NCPCs followed their own methodologies to monitor the implementation of the project.

### **Budgeting & Funding of M&E Activities**

At the ‘Project Design’ stage, specific budgets were not created for M&E of the project activities. No long-term monitoring of the project was planned and no finances were allocated to review the impact of the project beyond the project funding by GEF. Hence, follow up evaluations on the gains from the project are not available with UNEP-DTIE.

Based on the above, the M&E overall rating has been evaluated as *Moderately Satisfactory*.

### **E. Catalytic Role**

As per UNEP-DTIE, based on the CP-EE approach and lessons learned from the current project a new project proposal was prepared and submitted to the Finnish Government, which has agreed to finance the new project. The new project with the name “Regional Industrial Pollution and CO<sub>2</sub> Emission Abatement Project for Arab Countries: (RIPECAP) is mainly based on the successful experience of the project “Promoting

Industrial Energy Efficiency through the Framework of Cleaner Production” (CP-EE Project).

The main objective of the project is to disseminate the benefits and applicability of cleaner production and energy efficiency approaches in three countries (Egypt, Jordan and Morocco) and will assess: i) the current situation of industrial pollution and emissions; ii) previous and on-going similar programmes/projects and their results; and iii) preliminary estimates of the amounts and costs of abating GHGs in the industries. The RIPECAP project will benefit and utilize the resources and tools developed under the CP-EE Project. In the course of this project, the needs of the beneficiary countries will be assessed and a detailed plan elaborated for co-ordinating the proposed project with other relevant regional UNEP/DTIE initiatives in the Arab region.

Moreover, to foster technology transfer, a “Technical Study Report” (based on an audit conducted in India) was developed to analyze the barriers and incentives for the adoption of an emerging industrial energy efficient technology, titled “the Rice Husk-Fired Fluidized Bed Combustion Boilers (FBC) technology for Cogeneration Systems”. This served as an example of a success story on EE-CP integration.

The old CPC in Czech Republic has created a market for its own professional services in the area of EE-CP from the experiences gained from the project. However, in Hungary, the capacity of CPC to carry out audits has been depleted, as the human resources trained under the project have left the CPC.

It can be concluded from above that the project has created overall capacities in the CP-EE area, thus playing the role of a catalyst in the participating countries.

## **F. Preparation and Readiness**

The evaluation has been carried out with reference to the following parameters.

### *a) Project objectives being clear, practical and feasible within its timeframe:*

The project proposal was prepared by UNEP-DTIE in discussions with the Directors of the six participating NCPCs, wherein, the project objectives were in a direct response to the specific information needs of SMEs identified by the NCPCs’ work.

Moreover, to ensure that the project objectives, outcomes and the timeframes were clear to the executing agencies (NCPCs), UNEP–DTIE and the National Productivity Council (NPC, India) organized and conducted in India (February 2002) a two-tier training program:

- 1) a three day basic training for the six NCPC directors followed by
- 2) an intensive two week training for technical staff from each NCPC.

Thus, it can be concluded that the project objectives were clear and accepted by all NCPCs and therefore to be practically feasible within the project time frame.

### *b) Consideration of the capacities of the executing agencies at the beginning of the project implementation:*

At the beginning of the project, all six countries had existing NCPCs established with government support and operating under a UNEP/UNIDO framework. The project was designed by UNEP-DTIE in consultation with the six NCPCs, based on the needs expressed by them. The capabilities of NCPCs were strengthened through training of NCPC personnel in areas of EE-CP. At present:

- In China, the National Cleaner Production Centre ( NCPC) is attached to the State Environmental Protection Agency (SEPA).
- India's centre is supported institutionally by the National Productivity Council (NPC), a semi-autonomous body affiliated with the Ministry of Industry that is well known for its expertise in energy management.
- The Vietnamese Cleaner Production Centre is supported by both the Ministry of Planning and Investment and the Ministry of Science, Technology and Environment,
- The Czech Cleaner Production Centre works in coordination with the Government to create awareness about the EE-CP activities, whereas the old NCPC had strengths to conduct EE-CP audits.
- In Slovakia, the Cleaner Production Centre is constituted as an NGO but has government officials on its Steering Committee.
- The Hungarian Cleaner Production Centre has departmental status within the Department of Environmental Economics and Technology in Faculty of Business Administration, Budapest University of Economic Science and Public Administration, which is a government institution, but capability constraints on conducting EE-CP audits.

Hence, due consideration was given to capacities of the executing agencies at the beginning of the project implementation.

*c) Lessons from other projects incorporated:*

As per discussions with UNEP-DTIE and NCPCs, organizational experiences were pooled to design this project objectives and deliverables.

*d) Existence of enabling legislation in place:*

Before the start of the project, the six project countries had all emphasized the need to improve industrial energy efficiency in their national environmental policies and programs:

- The Czech Republic addressed the need to improve energy efficiency in Governmental Decree 252 (1991) and mentioned the importance of energy conservation explicitly in its State Environmental Policy.
- Slovakia revised its national energy policy in 1999; the policy recommended 'optimization of State support to rationalization of energy use and minimization of energy consumption'.
- India had since mid-1970s emphasized the need to improve industrial energy efficiency and had a number of government programs that supported investments.
- China established a National Energy Conservation Information Centre and started investigating how enterprises interested in environmental management

system certification (particularly ISO14001) can be linked to energy conservation.

- Hungary and Vietnam similarly made energy efficiency in industry a national priority.

The foresaid created an enabling environment for the project to succeed.

*e) Effectiveness/efficiency/adaptability of the Project Management and supervision of project activities at all levels i) Policy decisions-Coordination group ii) day to day project coordination iii) UNEP-DTIE guidance.*

As already elaborated in Section 3.1 C ‘Achievements of Output & activities’, the project has been efficient in achieving its output targets (for details see **Annexes IV & V**).

Considering the geographical extension of the project involving 6 countries in 2 very different Continents; the nature of the activities; the number of industries involved; and the achievement or results, it can be concluded that project management was effective both at the UNEP-DTIE and the NCPC levels.

However, there was no project Steering Committee to review the project outcomes and collate feedback at various stages of the project implementation and take corrective action. UNEP-DTIE through its MOU’s (I, II & III) followed up on the project activities and undertook six project revisions (elaborated in section I below).

As regards to the project management and guidance provided by UNEP-DTIE, all the participating NCPCs have expressed their appreciation for UNEP-DTIE during the evaluation interviews.

Hence, considering all the factors above described, the preparation and readiness of the project has been rated as “Highly Satisfactory”.

## **G. Country Ownership & Drivenness**

The project has been in line with the national priorities and plans for all the participating countries. Moreover, the rising costs of energy and considerations for cleaner production, prompted development of EE framework and CP regulations at the national and regional levels, during the implementation phase of the project.

The project has created awareness and drive for the EE and CP activities in the participating units in the SME sector, thus contributing indirectly to the national priorities and plans.

Various national stakeholders including industrial associations in the participating countries have been involved with providing feedback on the project. Their SME members have benefited from the project activities as the project has been able to provide information and tools to the participating SMEs, so as to integrate the EE and CP activities in their ‘Core Business Activities’.

Though the project created awareness among various stakeholders and fostered the creation of an enabling environment that led to creation of EE-CP initiatives at the

national level, there has been no direct co-financing from the Governments of the participating countries.

Further, in absence of correlated evidence about the project impacting the national policies, it cannot be assessed whether the project impacted the national EE-CP policies directly.

Considering above, the project has been rated as “Unsatisfactory” on country ownership and driveness.

## **H. Stakeholders’ Involvement**

Stakeholders’ involvement has been evaluated at the following levels:

- a) *Various project stages (Design, implementation and monitoring):*  
Discussions with UNEP-DTIE, NCPCs, SMEs and various interviewees (see **Annex II**), indicated that the aforementioned stakeholders were consulted at various stages of the project design, implementation and monitoring. The correlated evidence of stakeholder’s direct involvement at various stages of the project is absent and hence cannot be ascertained with certainty.
- b) *Did project implement appropriate outreach and public awareness activities?*  
As discussed in section C, UNEP-DTIE in collaboration with NCPCs in India, China and Vietnam prepared nine “Business Cases brochures” depicting integrated CP-EE approach/methodology based on the audits conducted in the project. MoUs were finalized and signed with India, China and Vietnam NCPCs for conducting and producing outreach activities so as to widely promote/disseminate the CP-EE approach and methodology.

NCPCs in Hungary, Slovak and Czech Republic implemented ‘Out reach Programs’ to disseminate the information, create awareness and build capacities of various stakeholders through their web sites, press/media, workshops and conferences .

Considering the above, the stakeholders’ involvement in the project is rated as ‘Moderately Unsatisfactory’.

## **I. Financial Planning**

Based on the discussions with UNEP-DTIE and the information made available by them (Annex **XIV**) six budget revisions for this project were made throughout the project lifetime (including reallocation of funds to the various budget lines).

The significant reasons provided by UNEP DTIE for the revisions include:

### *Revision 1:*

- a) To reflect the actual expenditure for the year 2002 to the GEF Trust Funds;
- b) To re-phase year 2002 unspent funds;
- c) To reflect the swapping of objects of expenditure description among Czech & Slovak Republics; and

- d) To extend the duration of the project through October 2004 to cater for delayed commencement of implementation.

*Revision 2:*

- a) To reflect the actual expenditure for the year 2003 to the GEF Trust Funds; and
- b) To re-phase year 2003 unspent funds

*Revision 3:*

- a. To extend the duration of the project to 30 May 2005:

In order to allow time for the completion of the activities yet to be implemented-organizing the two regional workshops for NCPCs in Latin America & African regions.

*Revision 4:*

- a) To reflect the actual expenditure for the year 2004 to the GEF Trust Funds;
- b) To re-phase year 2004 unspent funds; and
- c) To extend the duration of the project through October 2005 to cater for delayed commencement of implementation.

*Revision 5:*

- a) To reflect the actual expenditure for the year 2005 to the GEF Trust Funds;
- b) To re-phase year 2005 unspent funds; and
- c) To extend the duration of the project through March 2006. This extension was requested by GEF, so as to help validate the GHG reductions achieved during the course of the project and to create an awareness activity in the participating countries by producing outreach material.

*Revision 6:*

- a) To reflect the actual expenditure for the year 2005 to the GEF Trust Funds;
- b) To re-phase year 2005 unspent funds; and
- c) To extend the duration of the project through June 2007 to allow completion of following activities:
  - Outreach Activity: NCPCs to develop promotional material & communication plan for CP-EE approach;
  - To promote an innovative energy technology of a cogeneration system using agricultural residue. Promoting awareness on integration of EE-CP technology;
  - To allow time for completion of GHG verification activities; and
  - To allocate funds for terminal evaluation of the project.

However, despite all the revisions the total cost of the project to the GEF Trust Funds and co-financing has remained unchanged. Hence, the financial planning on the project has been rated as “Satisfactory”.

## **J. UNEP Backstopping & Supervision**

As per the discussions with participating NCPCs and SMEs interviewed during the evaluation, UNEP-DTIE has performed well in providing the technical support on all the project activities. Moreover, UNEP-DTIE was able to:

- Coordinate the development of the CP-EE enhanced manuals (CP-EE Manual) and other tools (GHG indicator) to enable NCPCs to conduct the CP-EE audits and increase the environmental and economic development benefits of greenhouse gas reduction measures;
- Increase the use of the CP-EE manual among enterprises, to provide more CP-EE technical options and energy savings that led to more GHG emission reductions;
- Help NCPCs prepare the audit reports in a way that would convert and illustrate the technical improvements/measures recommended as economic value for; money. This made EE measures more affordable and easily understandable to top management within the units/industrial facilities;
- Broaden the base users of the UNEP tool “GHG Indicator-Guidelines for Calculating Greenhouse Gas Emissions”, to provide a measuring and reporting tool for the GHG emissions reduction within a company; and
- Increase the use and enhance the CP-EE Intranet site, as an information web based tool, to facilitate information exchange between project partners.

From the above, UNEP supervision of the project is hereby rated as “Highly Satisfactory”.

#### **4. Conclusions**

As per discussions with various stakeholders during the evaluation, it has been observed that the project has been able to create awareness and build capacities on the EE-CP integration amongst them.

Furthermore, based on the information provided by UNEP-DTIE (quantification could not be verified due to lack of correlated evidence), it can be concluded that the project has succeeded in meeting its objective of reducing emission of Green House Gases (GHGs) by identifying and implementing Energy Efficiency (EE) improvements as an integral part of CP-EM audits in Small and Medium size Enterprises (SMEs) in six countries.

There have been revisions in the timelines (project duration was 20 months starting in February 2002, which was later revised and extended to be completed in June 2007, making a total duration of 63 months), budgets (despite all the revisions the total cost of the project to the GEF Trust Funds and co-financing has remained unchanged) and development of an M&E protocol as the project progressed.

Considering the foresaid and the fact that the project was in SMEs in six different countries across two continents the overall rating of the project is evaluated as 'Satisfactory'.

## 4.1. Summary of the Project Ratings

The summary of the various ratings based on the discussions provided above and as per Evaluation TOR are provided below:

<b>Criterion</b>	<b>Evaluator's Rating</b>	<b>EOU Rating</b>
<b>A. Attainment of project objectives and results (overall rating)</b> Sub criteria (below)	S	Project main objectives seem to have been achieved although not all the countries involved attempted "policy influence" as intended by the project <b>S</b>
A. 1. Effectiveness	S	
A. 2. Relevance	HS	
A. 3. Efficiency	S	
<b>B. Sustainability of Project outcomes (overall rating)</b> Sub criteria (below)	ML	The project produced important outputs such as training and the EE-CP manual which will have long-lasting benefits expanding to countries not involved in this project too. <b>L</b>
B. 1. Financial	ML	
B. 2. Socio-Political	ML	
B.3. Institutional framework and governance	ML	
<b>C. Achievement of outputs and activities</b>	S	All planned activities were carried out and important outputs achieved with high standards <b>HS</b>
<b>D. Monitoring and Evaluation (overall rating)</b> Sub criteria (below)	MS	Sample verifications should have occurred in all 6 participating countries. A monitoring

Criterion	Evaluator's Rating	EOU Rating
		plan should have been thought through at project design stage regardless of GEF formal requirements <b>MS</b>
D. 1. M&E Design	MS	
D. 2. M&E Plan Implementation (use for adaptive management)	MS	
D. 3. Budgeting and Funding for M&E activities	MS	
<b>E. Catalytic Role</b>	S	EOU agrees with the consultant <b>S</b>
<b>F. Preparation and readiness</b>	S	EOU agrees with the evaluator <b>S</b>
<b>G. Country- ownership/drivenness</b>	U	EOU agrees with the evaluator <b>U</b>
<b>H. Stakeholders involvement</b>	MU	No evidence that important stakeholders' (such as governments) were involved during project design stage or during project execution. However, engagement with other, perhaps more relevant, stakeholder groups was quite good. <b>MS</b>
<b>I. Financial planning</b>	S	Six budget revisions are not an indication of good financial planning. <b>MS</b>
<b>J. UNEP Supervision and backstopping</b>	HS	UNEP supervision appears to have been

Criterion	Evaluator's Rating	EOU Rating
		very active, however, some limitations were found in the M&E activities <b>S</b>
<b>Overall Rating</b>	<b>S</b>	<b>MS</b>

S- Satisfactory, HS- highly Satisfactory, ML-Most Likely, MS-Moderately Satisfactory, MU-Moderately Unsatisfactory, U-Unsatisfactory, HU-Highly Unsatisfactory

## 4.2 Recommendations

1. Typical GEF projects range from demonstration projects and direct investments, to financing mechanisms that leverage local private sector financing, to capacity building and technical assistance, to the development and implementation of government policies supporting climate-friendly investments (leading to GHG reductions, as in the current project) in energy and other sectors.

Moreover, the GEF projects typically focus on facilitating future market development, removing barriers, and putting the right conditions in place so that emissions and energy needs will not rise in the future. These projects are necessarily risky, their outcomes uncertain, and they vary in their degree of uncertainty both between and within projects. GEF projects are typically exposed to a larger number of implementation uncertainties, which decrease the probability that the expected positive outcomes of a project to be achieved in the given amount of time.

A GEF project can have direct CO<sub>2</sub> emission reductions achieved by investments that are directly part of the results of the projects; direct post-project emission reductions through those investments that are supported by GEF-sponsored financial mechanisms still active after the projects' supervised duration; and a range of indirect impacts through market facilitation and development.

GEF has developed a Manual for calculating GHG benefits of GEF projects: Energy Efficiency and Renewable Energy Projects.

The future projects can use the guidance provided in the fore mentioned manual for the calculation of GHG benefits accruing from the GEF projects.

2. During the evaluation, SMEs have indicated that the Banks and Financial Institutions lack full understanding of financing based on energy efficiency investments. It is recommended that in future GEF projects, a component may be

included to build the capacities of the ‘Bankers/Financial Institutions (FIs)’ in the area of energy efficiency and cleaner production. This would help financing the EE-CP projects in the SMEs.

### **4.3. Lessons Learnt**

1. For success of a project in SMEs, it is essential that views of all the stakeholders are considered at the design, planning and implementation stage of the project.
2. Creation of a robust M&E plan (including Key Performance Indicators) at the design stage of the project helps avoid revisions in the project planning and re-allocation of funds.
3. In SMEs, generally the implementation of Energy Efficiency-Cleaner Production (EE-CP) audit recommendations, result in three types of investment actions:
  - A. Housekeeping actions with small investments and payback periods of less than one year- financed by internal funds.
  - B. Short-term (one year or less payback period) equipment related investments are generally financed by SMEs through their own operating budget or small loans.
  - C. Long-term (more than one year) large investments are financed by external loans.

For the project requiring small investments, the first and the best actions SMEs can take for the implementation of these are those which are mobilized by their internal funds as most of the CP-EE Project audits focus mostly on actions of types A and partly B.