

## 1. Project Data

Summary project data			
GEF project ID		3786	
GEF Agency project ID		103071	
GEF Replenishment Phase		GEF-4	
Lead GEF Agency (include all for joint projects)		UNIDO	
Project name		CF: Industrial Energy Efficiency	
Country/Countries		Thailand	
Region		Asia	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		CC SP-2	
Executing agencies involved		Department of Industrial Promotion (DIP); Department of Industrial Works (DIW); Thai Industrial Standards Institute (TISI); Department of Alternative Energy Development and Efficiency (DEDE)	
NGOs/CBOs involvement		Not available	
Private sector involvement		SME Development Bank and CIMB Thai (project partners)	
CEO Endorsement (FSP) / Approval date (MSP)		February 4, 2011	
Effectiveness date / project start		March 6, 2012	
Expected date of project completion (at start)		August 31, 2016	
Actual date of project completion		September 30, 2018	
Project Financing			
		At Endorsement (US \$M)	At Completion (US \$M)
Project Preparation Grant	GEF funding	.1	.1
	Co-financing	.13	.13
GEF Project Grant		3.62	3.62
Co-financing	IA own		
	Government	7.65	4.67
	Other multi- /bi-laterals		
	Private sector	8	1.83
	NGOs/CSOs		
Total GEF funding		3.72	3.72
Total Co-financing		15.78	6.63
Total project funding (GEF grant(s) + co-financing)		19.5	10.35
Terminal evaluation/review information			
TE completion date		August 2019	
Author of TE		Independent Evaluation Division, Office of Evaluation and Internal Oversight, UNIDO	
TER completion date		January 6, 2019	
TER prepared by		Laura Nissley	
TER peer review by (if GEF IEO review)		Molly Sohn	

## 2. Summary of Project Ratings

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

## 3. Project Objectives

### 3.1 Global Environmental Objectives of the project:

The Global Environmental Objective of the project was to “promote industrial EE [energy efficiency] through adoption of ISO [International Organization for Standardization] based energy management standards and system optimization approach for improvement of energy performance of industries to make its operations more reliable and competitive” (TE pg. 8). The CEO Endorsement Document also notes that the project “interventions will lead to energy savings for the industry, which can be translated into GHG emission reductions based on the fuel/electricity used” (pg. 18).

### 3.2 Development Objectives of the project:

The Development Objectives of the project were to “i) increase the awareness and reinforce Thailand’s efforts on the implementation of energy management system based on ISO 50001 to urge industrial enterprises to integrate EE [energy efficiency] as part of the management cycle for the realization of continuous energy savings, and ii) incorporate industrial energy systems optimization as a mean to maximize energy savings and reduce production costs” (CEO Endorsement Document pgs. 10-11).

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

The TE does not indicate that there were any changes to the Global Environmental or Development Objectives during implementation. The TE does note that the project adapted certain project activities in response to changes in the project’s environment, including: (1) less emphasis on the national awareness campaign due to a similar effort by Thai Industrial Standards Institute (TISI) (TE pg. 18); (2) adding a mid-level course on energy management standards (EnMS) and systems optimization; (3) adding a Bachelor’s course for universities (TE pgs. 39-40); and (4) the lending scheme was not needed by participating factories to implement EnMS and system optimization (TE pg. 47).

#### 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: <b>Satisfactory</b>
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The TE provides a rating of **Satisfactory** for project relevance, and this TER concurs. The project's objectives are consistent with GEF-4 Climate Change Strategic Program 2: *Promoting Energy Efficiency in the Industrial Sector*. Additionally, the TE notes that the project was consistent with Thailand's energy regulatory and policy framework, as well as directly supported the government's energy efficiency programs (TE pg. 38). Specifically, the CEO Endorsement Document indicates that the project is consistent with the Energy Conservation Act and the National Strategic Plan on Climate Change (2008-2012) (pg. 19). Additionally, the TE notes that the project "complemented the work undertaken by the DEDE [Department of Alternative Energy Development and Efficiency] on energy management standards. It complemented efforts of DIP [Department of Industrial Promotion] and DEDE towards improving the energy efficiency of industries and thereby, making industrial operations more reliable and competitive" (pg. 38-39).

4.2 Effectiveness	Rating: <b>Satisfactory</b>
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The TE provides a rating of **Satisfactory** for project effectiveness, and this TER concurs. The project's objective was to promote industrial energy efficiency through adoption of International Organization for Standardization (ISO) based energy management standards and system optimization approach for improvement of energy performance of industries to make its operations more reliable and competitive (TE pg. 8). A weakness in the project design is that outcome level indicators were not provided in the results framework, making it difficult to assess the higher-level results of the project's activities and outputs. However, the project achieved most of its output targets by its completion date, as well as exceeding its targets at the objective level: 111,307 MWh of electricity saved (133% of the target); fuel savings of 2,713,001 GJ (142% of the target); and a GHG emissions reduction of 247,047 t CO<sub>2</sub>. The TE was also able to verify that 10% of the total ISO 50001 certifications in Thailand were carried out

through the GEF project (pg. 25). Moreover, the TE notes that the project “succeeded in adding significant human capacity to the industrial energy efficiency market of Thailand” (pg. 26).

A summary of the project’s achievements, by component and output, is provided below. It should also be noted that the project carried out additional activities not anticipated in the original project document, including a mid-level training course on energy management standards (EnMS) and systems optimization, and a Bachelor’s course (TE pg. 40).

### **Component 1: International Organization for Standardization (ISO) Compliant Energy Management Systems**

Expected results under this component included: (1) Training material and tools on energy management developed; (2) national awareness campaign launched on ISO 50001; (3) National experts/factory personnel trained on ISO compliant energy management systems; and (4) Peer-to-peer network between industrial enterprises established and operated. By project end, training materials and tools were developed, and a national awareness campaign had taken place. The TE does note that the “awareness campaign was carried out to a lesser degree than originally planned” to avoid duplicating a campaign by the Thai Industrial Standards Institute (TISI) (pg. 18). By project end, 62 national experts were trained in EnMS, as well as 612 factory managers, exceeding the project’s targets by 124% and 122% respectively (TE pg. 93). Additionally, a basecamp website was produced and used as a peer-to-peer network for national experts (TE pg. 19).

### **Component 2: Industrial Energy Systems Optimization**

Expected results under this component included: (1) training material and tools on systems optimization developed; (2) national experts/factory personnel trained on optimization of steam, compressed air, pumping and fan systems; and (3) equipment vendors/suppliers trained on systems optimization. By project end, training materials and tools on systems optimization were developed, and 48 national experts (96% of the target), 1,126 factory personnel (282% of the target), and 60 suppliers/vendors (120% of the target) were trained (TE pg. 94).

### **Component 3: Enhancement of Industrial Energy Efficiency Financing Capacity**

Expected results under this component included: (1) harmonized energy efficiency project evaluation criteria; (2) capacity of banks/financial institutions enhanced on energy efficiency projects financing; and (3) training materials on the development of financial proposals developed and industry managers trained. By project end, a report on harmonized energy efficiency project evaluation criteria was developed. Additionally, 87 factory personnel from 40 factories, as well as 34 bank personnel from 9 banks, were trained on energy efficiency projects’ evaluation. Training materials on developing financial proposals were also developed and managers trained (TE pg. 94)

### **Component 4: Implementation of Energy Management and Systems Optimization Projects**

Expected results under this component included: (1) energy management projects implemented; (2) documented systems optimization demonstration projects; and (3) recognition program developed. By project end, 200 factories adopted energy management plans (100% of the target) and 50 factories installed energy management systems (100% of the target). Of the 50 factories with systems in place, 25

received ISO 50001 certification. Additionally, 76 system optimization assessments were carried out, 74 of which led to completed optimization projects (101% of the target). 12 case studies on EnMS were published, as well as 13 studies on systems optimization (100% of the target). By project end, energy performance indicators were set up, and DIP and DEDE recognized industries with awards based on these indicators (TE pg. 95).

4.3 <b>Efficiency</b>	Rating: <b>Satisfactory</b>
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The TE provides a rating of **Satisfactory** for project efficiency, and this TER concurs. The project was scheduled to begin implementation on March 1, 2011, however the Thai Government did not approve the project until March 6, 2012 (TE pg. 33). The project received a 14-month extension in order to complete activities, including implementing energy management standards (EnMS) and systems optimization projects (Component 4); compiling indicator data; preparing the final report; transferring equipment; and conducting the TE (TE pg. 40).

The TE does indicate that the project completed all of the expected outputs within budget (pg. 39). The TE also notes that the project “practiced adaptive management and diverted from certain project design aspects in response to changes in the project’s environment” (pg. 18). For example, less emphasis was put on the national awareness campaign in order to avoid duplicating a campaign by the Thai Industrial Standards Institute (TISI) (pg. 18). Additionally, after consultation with beneficiaries, the project developed a mid-level training course on EnMS and systems optimization, as well as a Bachelor’s course for universities, which were not anticipated in the original project design (TE pgs. 39-40).

4.4 <b>Sustainability</b>	Rating: <b>Moderately Likely</b>
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The TE assesses the sustainability of the project’s benefits to be **Likely**, which this TER downgrades to **Moderately Likely**.

#### **Financial Resources**

The TE does not provide a separate rating for the sustainability of financial resources, which this TER assesses to be **Likely**. A follow-up project, “Greening Industry through Low Carbon Technology Applications for Small and Medium Enterprises,” was approved and will build on activities from this project. Additionally, the project’s industrial partners indicated that “sufficient capital is available to carry out energy efficiency measures if management priorities are directed this way” (TE pg. 42). The TE does indicate that one of the project’s partners, the Thai Industrial Standards Institute (TISI) is very

restricted financially and therefore won't be able to continue with training or awareness-raising (TE pg. 42).

### **Sociopolitical**

The TE does not provide a separate rating for the sustainability of financial resources, which this TER assesses to be **Moderately Likely**. The project trained a substantial number of national experts and factory personnel, who the TE indicates have continued to share their knowledge beyond the life of the project, including teaching at universities and conducting trainings (TE pg. 41). However, the two national counterparts that the project worked closely with, TISI and the Department of Industrial Promotion (DIP), discontinued most of their training activities around energy management and ISO 50001 in 2017. The TE does note there is the potential for activities to be restarted in light of the revised ISO 50001 announced for 2019, however this is not guaranteed (pg. 42). Additionally, the TE notes that it is unclear "to what degree the government is willing to impose higher energy prices on the industry to promote energy savings and create the economic business case for increased investment (TE pg. 42).

### **Institutional Frameworks and Governance**

The TE does not provide a separate rating for the sustainability of financial resources, which this TER assesses to be **Moderately Likely**. A key risk to institutional sustainability is that the current framework does not provide incentives for factories to apply for ISO 50001 certification, but rather to fulfill the minimum legal requirements only (TE pg. 42). Additionally, the TE indicates the training approach and materials were not fully institutionalized by the national counterparts by the end of the project (pg. 43).

### **Environmental**

The TE rates environmental sustainability to be **Likely**, which this TER downgrades to **Moderately Likely**. The TE indicates that the project activities contribute to removing emissions from fossil fuel combustion, which mitigates environmental risks. On the other hand, the TE notes that "rebound effects" (i.e. an increase in production that cancels out energy savings; income savings are used to invest in more energy intensive goods; etc.) are still a risk from industrial consumers (TE pg. 16; 42).

## **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 significantly lower than expected (\$6.63 million vs. \$15.78 million). The TE indicates that this was partially due to the fact that the lending scheme of the participating banks (SME Development Bank and CIMB Thai) was not used in the project, as no loans were requested by the participating factories for activities under Component 4 (TE pg. 50). Additionally, co-financing from the

national counterparts was less than expected, with only 70% of co-financing actualized. The TE notes that this was due to TISI and DIP discontinuing training activities in 2017 (TE pg. 8; 50). This has the potential to affect the sociopolitical sustainability of the project, although the TE notes there is the potential for activities to be restarted “if the demand for training increases with the revised ISO 50001 version announced for 2019” (pg. 42).

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?

The project start date was extended one year, from March 2011 to March 2012, due to delays in signing the project document by the Thai Government. As a result, the project received a 14-month extension in order to complete activities under Component 4, as well as to compile impact indicator data, prepare the final report, transfer equipment, and conduct the TE (TE pg. 40). The TE does not indicate that this extension affected the project’s outcomes or sustainability.

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, however it does note that collaboration between the national counterparts (DIP, Department of Industrial Works, TISI, and the Department of Alternative Energy Development and Efficiency) and the project was strong. The national counterparts also played an active role in the Project Steering Committee. However, the primary counterparts, DIP and TISI, suspended their activities in 2017 and did not fulfill their co-financing obligations (TE pg. 49). As noted above, this has the potential to affect the sustainability of the project outcomes, particularly around future training of national experts and factory personnel. Additionally, the TE notes that “the government’s focus seems to have shifted towards digitalization...with management systems receiving less attention” (pg.49). Other priorities include the replacement of equipment and the award scheme (TE pg. 49).

## 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: <b>Moderately Satisfactory</b>
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The TE provides a rating of **Satisfactory** for M&E Design, which this TER downgrades to **Moderately Satisfactory**. The Project Document included a results framework outlining the expected project outputs, outcomes, and objectives. The objective and output level indicators provided in the results framework were generally SMART (specific, measurable, achievable, realistic, and timely). The TE identified 3 out of 21 indicators which were vague or needed clear, realistic targets set (pg. 35). A more significant weakness in the project design, however, was the lack of outcome level indicators. As the TE notes, "The lack of indicators means that intended outcomes following the outputs are neither specified nor measurable" (pg. 34). On the other hand, the Project Document does outline a detailed M&E plan, including M&E activities, responsible parties, and a realistic timeline for implementation. Additionally, the Project Document includes a \$125,000 budget for an M&E system, or 3% of the total budget (TE pg. 33).

6.2 M&E Implementation	Rating: <b>Satisfactory</b>
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The TE rates M&E implementation as **Satisfactory**, and this TER concurs. The TE indicates that an M&E system was in place throughout the life of the project, and that both the implementing agency, UNIDO, and the project management unit (PMU) carried out their M&E responsibilities effectively. The PMU regularly reported on M&E data in both progress and annual reports, which allowed UNIDO to easily monitor project activities and results. As noted above, however, the lack of outcome level indicators did mean that progress could not be tracked at that level (TE pgs. 54-55). A midterm evaluation, conducted in 2016, found that the Project Steering Committee utilized monitoring data to detect and address issues promptly (pg. 41). The findings of the midterm evaluation were also incorporated into the project strategy, including the formulation of an effective exit strategy (TE pg. 54). Overall, the M&E system functioned effectively and was used to improve project performance.



## 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: <b>Satisfactory</b>
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The TE provides a rating of **Highly Satisfactory** for the performance of UNIDO, the implementing agency for this project. This TER provides a rating of **Satisfactory** for the quality of project implementation. The project design was relevant to the country context, and included innovative approaches, such as training coupled with on-site learning experiences (TE pg. 26). The project results framework was logical and hierarchical and was an effective tool for tracking progress at the output and objective levels. The omission of outcome indicators did make it difficult to track progress beyond the output level, however the M&E plan was otherwise appropriate for the project. An M&E system was in place during the project and used as a tool for adaptive management; including the decision to develop a mid-level training course on EnMS and systems optimization, as well as an exit strategy. Overall, the TE indicates that UNIDO provided the Project Management Unit (PMU) with sufficient support, quick responses, guidance, as well as leadership (TE pg. 48).

7.2 Quality of Project Execution	Rating: <b>Satisfactory</b>
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The TE does not provide a separate rating for the quality of project execution, which this TER assesses as **Satisfactory**. The Project Management Unit (PMU) was initially based out of the UNIDO Regional Office in Bangkok, and later moved to the Department of Industrial Promotion (DIP) (TE pg. 48). A National Project Coordinator (NPC) was responsible for the day-to-day operations of the project. The Project Steering Committee met regularly throughout the life of the project and provided overall guidance to the PMU, as well as coordinated with project partners (Midterm Evaluation, pg. 41). Additionally, project reports were detailed with well-justified ratings supported by M&E data (TE pg. 54).

The project did experience delays at start-up and required a 14-month extension to complete activities, however this did not affect the achievement of project objectives or sustainability. The TE does note that the project “failed to hand over its products (case studies, website, and training materials) directly

to one of the government's partners because the national counterparts that the project was most engaged with (DIP and TISI) discontinued most of their training activities in the field of energy management and ISO 50001" (pgs. 41-42). The TE notes that this did threaten institutional aspects of project sustainability (pg. 42).

## 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.

As a direct consequence of the project's activities, 111,307 MWh of electricity was saved, in addition to a fuel savings of 2,713,001 GJ, and a GHG emissions reduction of 247,047 t CO<sub>2</sub> (TE pg. 24).

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 does not indicate any socioeconomic changes which took place by the end of the project.

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

The TE notes that "it is safe to say that the project succeeded in adding significant human capacity to the industrial energy efficiency market of Thailand" (TE pg. 26). Overall, 62 national

experts were trained in EnMS, as well as 612 factory managers (TE pg. 93). Additionally, 87 factory personnel from 40 factories, as well as 34 bank personnel from 9 banks, were trained on energy efficiency projects' evaluation (TE pg. 94).

By project end, 200 factories adopted energy management plans and 50 factories installed energy management systems. Of the 50 factories with systems in place, 25 received ISO 50001 certification. Additionally, 76 system optimization assessments were carried out, 74 of which led to completed optimization projects. 12 case studies on EnMS were published, as well as 13 studies on systems optimization (TE pg. 95).

#### b) Governance

The TE does not indicate any notable changes in governance by the end of the project.

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 indicate any unintended impacts.

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 analyzes the potential for mainstreaming and replication of activities, however there isn't evidence that this has happened yet. One possible indication of scaling up is that between 2012 and 2016 ISO 50001 certifications increased from 41 to 255, which could indicate that interest in energy efficiency and energy management systems is increasing in Thailand (TE pg. 31). The TE also indicates that a follow-up project, "Greening Industry through Low Carbon Technology Applications for Small and Medium Enterprises," was approved and will build on activities from this project.

## 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 and good practices (pg. 67):

- The pilot companies do not only have to fulfil formal requirements such as technologies in use but are more effective if they are also willing to engage with other companies and share their experiences publicly and among company networks.
- The project prepared excellent reports which presented the findings in a well laid out fashion. Such a format could serve as an example for other projects.
- The team carried out an online course to maximize knowledge sharing in remote destinations.
- PMU addressed the academic community as an additional element for setting framework conditions. Closer cooperation with educational institutions might be a useful addition to similar projects.

## 9.2 Briefly describe the recommendations given in the terminal evaluation.

The TE provides the following recommendations (pgs. xiii-xiv):

- To UNIDO: Monitoring of project impacts could be improved with respect to the following aspects:
  - Improve the assessment of attribution, e.g. by better tracking free-rider effects to strengthen the meaningfulness and reliability of the data collected.
  - Introduce a standard approach for consideration of rebound effects or standardized tools to assess rebound effects.
  - Pay more attention to SMART outcome indicators.
  - Use coherent survey tools to monitor training participants' feedback.
  - Measure the outreach of awareness components, there is a lack of verification how far case studies and other materials are spread among the target group.
- To **UNIDO**: Gender mainstreaming. UNIDO should increase its efforts to deploy female international experts into partner countries.
- To **UNIDO**: Secure parts of the awareness budget for the finalized project website. In a comparatively mature market for energy efficiency, it might be useful to move some of the national awareness campaign budget to the end of a project to draw attention to a central media outlet such as the IEE website which is filled with local IEE content and particularly with case studies only late in the project lifetime.
- To **UNIDO**: Future projects might want to pay more careful attention to the needs of the independent national experts to work as energy advisers, e.g. by equipping them if needed with necessary business skills.
- To **UNIDO**: Projects should be embedded in a broader vision of resource efficiency and decarbonisation. Considerations of embedded energy, resource consumption and decarbonisation (e.g. by including renewable energy) should find their way into designing IEE projects.
- To **GEF** and **UNIDO**: GEF should clarify concerns with specific sectors. Several of the sectors targeted by the IEE portfolio are high-environmental impact sectors contributing to significant amounts of pollution and natural habitat destruction, among them petrochemical industries including single-use plastics-producers, mining, palm oil plantations, and petroleum refineries. Some of such high-impact sectors were also targeted in the case of the project at hand. While

damages are not caused by the project itself, the efficiency gains promoted by the project can potentially improve the profitability of these activities hence resulting in environmental risks unless specific measures are undertaken to mitigate them. GEF and UNIDO should define more clearly the due diligence processes under which work with certain types of industries are allowed, e.g. obliging partner companies to adhere to sectoral sustainability certifications.

- To the **Government of Thailand** and **UNIDO**: More careful attention should be paid to the institutionalization of project results and coordination with existing national initiatives, in the case of the project at hand a policy component might have served to serve this purpose.
- To the **Government of Thailand**: Closer cooperation of government stakeholders, in the case at hand after other stakeholders discontinued their training activities a stronger involvement of DEDE might have benefited the coordination and institutionalization of project results.

## 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 effectiveness section could have been better organized and included a more complete analysis of the project's outcomes regarding training, instead of lumping them all together.	<b>MS</b>
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report is internally consistent, and the evidence is complete and convincing.	<b>S</b>
To what extent does the report properly assess project sustainability and/or project exit strategy?	The report provides an extensive assessment of the project's sustainability and exit strategy.	<b>S</b>
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	The lessons learned are comprehensive and supported by evidence.	<b>S</b>
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The report includes the actual project costs and co-financing.	<b>S</b>
Assess the quality of the report's evaluation of project M&E systems:	The report adequately assesses M&E design and implementation.	<b>S</b>
<b>Overall TE Rating</b>		<b>S</b>

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

*Midterm Review (2016)*