GEF LESSONS NOTES 14

www.gefweb.org

24935

July 2002

Best Practices in Project

Monitoring and Evaluation:

Lessons Learned in Manufacturing and Marketing of Energy Efficient Products

Introduction

The GEF Operational Strategy is built around 10 operational principles, and one of those principles addresses monitoring and evaluation: "The GEF will ensure that its programs and projects are monitored and evaluated on a regular basis." This Lessons Note shares practical lessons from the monitoring and evaluation (M&E) experience of four GEF projects, so that other projects may benefit from these experiences.

The projects discussed in this Lessons Notes are:

- Poland Efficient Lighting Project (PELP)
- Thailand Promotion of Electricity Energy Efficiency (Thai DSM)
- Mexico High Efficiency Lighting Pilot (Ilumex)
- Efficient Lighting Initiative (ELI)

These projects were included in a review of the GEF's climate change projects that target the manufacture and marketing of energy-efficient products. A review of this cluster of projects was carried out in 2001 as part of the overall assessment of the performance of GEF-supported activities in the climate change focal area.[1]

Monitoring and Evaluation Integral to All GEF Projects

Findings from the careful monitoring and evaluation of project indicators have a variety of uses. First and foremost, when properly integrated into a project's design and implementation, M&E can provide feedback to project managers, enabling them to modify implementation in response to changed circumstances; in this way, M&E becomes part of any project's risk mitigation strategy (see ELI example in Box 1). M&E results also have value for other interested parties, such as national governments or electric utilities, and

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In 2001, GEF's monitoring and evaluation (M&E) team evaluated the use of market transformation approaches to stimulate the manufacture and use of energy-efficient products. Eight projects were reviewed, seven of which are being implemented in China (3), Mexico (1), Poland (1), and Thailand (2), while the eighth, a multicountry initiative, is being carried out by seven countries on four continents. In its examination of project impacts, sustainability, and replication, the review generated some key lessons about the how an effective project monitoring and evaluation plan can help promote the desired market transformations. One of the most crucial lessons is the importance of M&E as an integral part of project design and implementation. This Lessons Notes *illustrates these lessons based on four of the reviewed projects.*

GEF Lessons Notes *are written to assist project designers, managers, and evaluators—in GEF implementing and executing agencies and beyond. We welcome your feedback and suggestions to ensure the ongoing practical value of the* Notes *series.*

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[1] The complete review is "The GEF Energy-Efficient Product Portfolio: Emerging Experience and Lessons" by Sabrina Birner and Eric Martinot (Washington, DC: Global Environment Facility, 2002).

Case Study: The Evaluation of the Poland Efficient Lighting Project (PELP)

The Poland Efficient Lighting Project (PELP), financed by the GEF and implemented through the International Finance Corporation (IFC), set out to reduce Polish greenhouse gas emissions by increasing the use of energy-efficient compact fluorescent lamps (CFLs) At the time the project was designed, CFLs were expensive and not well-known, and consumer demand for them was low. PELP sought to address this combination of high prices and low demand on two fronts First, PELP lowered CFL prices with a subsidy to qualified manufacturers, and, second, it increased consumer awareness of the lamps through a mass-media campaign PELP's CFL promotions took place in the autumn and winter of 1995/96 and 1996/97 PELP also hoped to have a lasting impact on the market beyond the end of its promotions.

PELP's design included an M&E plan that would assess the project's effectiveness. The M&E plan aimed to·

- Quantify direct program impacts What were the kWh and carbon dioxide emissions savings from the sale and installation of CFLs labeled and subsidized through PELP?
- Quantify indirect impacts In what ways did PELP lead to long-term transformations of the Polish CFL market?
- Summarize project experience· What are the lessons from PELP that would be helpful to future GEF projects?

PELP evaluators sought information from different market actors to answer these questions To track consumers' awareness and use of CFLs, a Polish market research firm interviewed both randomly selected consumers and purchasers of PELP-labeled CFLs To gain insight into the CFL market's evolution, the firm also surveyed retailers about parameters such as CFL sales and the number of different models available From manufacturers, evaluators obtained information on sales of PELP-labeled CFLs.

To better track PELP's impact, data collection took place before, during, and after the project A baseline study[2] was conducted before PELP's CFL promotion, and consumers and retailers were surveyed during the program and into late 1998, over a year and a half after PELP's completion Program managers used data collected over the course of the project to respond to changing market conditions and adjust the implementation strategy

Two evaluation tools, a media clipping service and consumer response cards, were especially valuable PELP hired a media clipping service to gather articles that mentioned CFLs These articles gave valuable insight into the general population's perception of CFLs In 1996, CFLs were reported as a "new" phenomenon A year later, news articles described them as an "expensive but viable" option for Polish households By 1998, they were considered a "popular" form of lighting, with many benefits to the people, the country, and the global environment

Participating manufacturers were required to package PELP-labeled CFLs with consumer response cards In exchange for answering questions on lighting use and purchase habits and mailing in the card, consumers were entered into a drawing for prizes. These cards were wildly popular. In each lighting season, PELP received over 10,000 cards—so many cards, in fact, that the post office delivered them daily by the bagful! The cards became a database of purchasers of PELP-labeled CFLs, the market research firm was then able to contact purchasers 1 to 2 years later and learn whether their CFL was still being used.

An American consulting firm designed the PELP evaluation, and a Polish market research firm carried out the associated market research; neither firm had any stake in the project's outcome The use of independent firms helped strengthen the credibility of the evaluation

The PELP evaluation did run into some difficulties. The evaluation plan depended on obtaining sales data from manufacturers, but manufacturers were reluctant to share this very sensitive data. Also, at the beginning of the project, certain nuances of consumer questionnaires were lost in translation. This was remedied by adding a specialized translator to the evaluation team Greater use of on-site meters to measure lighting energy use also would have helped resolve some data ambiguities. Finally, in retrospect, a "comparison country" would have been helpful as a control against which to measure changes in the Polish market.

In spite of these difficulties, the PELP evaluation was able to obtain credible data that showed, from several different perspectives, PELP's effectiveness in increasing sales of CFLs Some of the evaluation's important findings include:

- CFL penetration increased from one in 10 households before PELP to one in three households 1 year after the close of PELP.
- Prices of CFLs declined by more than 34 percent during the program. These price decreases were sustained after the program and have not reverted to pre-subsidy levels.
- CFLs became more widely stocked (more stores carry CFLs and carry more models), and data from 1 year after the program indicated that this retail availability was sustained.
- Ninety-seven percent of CFL purchasers intended to replace their CFLs with another CFL when the current one burns out
- Print media coverage increased and shifted from explaining what CFLs are to describing where and how to best use them, indicating the now-common use of CFLs

These indicators demonstrate a widespread and sustainable change in the residential market for CFLs in Poland The evaluation also measured PELP's overall impact—a savings of 2,320 GWh, or 2 8 million metric tons of CO2 avoided, at a cost of $1 39 per ton These strong M&E results supported the creation of a follow-on GEF project, the Efficient Lighting Initiative (ELI), which is currently being implemented by the IFC in seven countries.

[2] **A baseline study determines the "business as usual" scenario—number of lamps sold, lamp prices, number of retailers selling the lamps, etc.—before the project begins. This information is essential for measuring the project's impact after completion.**

Before beginning its M&E activities, the Thai DSM project relied on engineering estimates alone for calculating the program's impact on peak load reduction. At the GEF and World Bank's insistence, they undertook a more rigorous evaluation effort, which included dedicated studies to assess such parameters as the coincidence factor (the amount of time an appliance is on during a utility's demand peak) and free riders (people who would have taken action even without the program), that led to greater accuracy. This increased accuracy allowed managers to better integrate the impact of DSM into their planning.

The M&E plan for ELI (see Box 1) creates a symbiotic relationship between M&E and implementation. ELI's mid-term process evaluation will provide data to the evaluation team as well as feedback to the implementation team.

Practical Guidance for Designing an M&E Plan

Budgeting for M&E

M&E should be an explicit line item in any proposal submitted to the GEF. The M&E line item should include allocations for pre-implementation baseline surveys, ongoing data gathering during implementation, and a post-program review of the persistence of the program's impacts.

GEF Recommendations for M&E Indicators

For organizations in the midst of planning an M&E strategy, it can be helpful to consider seven core project indicators.[4] They are presented below as guidance; however, the relative importance of an indicator depends on the project's activities. For example, for a project seeking mainly to develop local energy-efficient manufacturing capacity, policy development (indicator five below) is less relevant.

1. Energy production or savings and installed capacities
2. Technology cost trajectories
3. Business and supporting services development
4. Financing availability and mechanisms
5. Policy development
6. Awareness and understanding of technologies
7. Energy consumption, fuel-use patterns, and impacts on end users

Table 1: M&E Criteria for GEF Projects

Work Program Inclusion	Describe how the project design has incorporated lessons from similar projects in the past. Describe approach for project M&E system, based on the project logical framework, including the following elements: • Specify indicators for objectives and outputs, including intermediate benchmarks and means of measurement • Outline organizational arrangement for implementing M&E • Indicate total cost of M&E (may be reflected in total project cost).
Project Brief Review or CEO Endorsement	Finalize M&E plan, including: • Detailed budget • Final organizational arrangements for implementing M&E • Indicators for project activities, including intermediate benchmarks and means of measurement.
Implementation/Completion	On an annual basis during project implementation, submit project implementation report to GEF M&E as input into the Project Implementation Report Prepare Project Completion Report and submit it to the GEF M&E department.

Source. GEF Project Cycle, October, 2000, Document GEF/C 16/INF7

[4] Source: "Measuring Results from Climate Change Programs: Performance Indicators for GEF." Monitoring and Evaluation Working Paper 4, September 2000.

Box 1: Overview of the Monitoring and Evaluation Plan of the Efficient Lighting Initiative (ELI)

The Efficient Lighting Initiative (ELI) aims to reduce greenhouse gas emissions by increasing the penetration of energy-efficient lighting technologies in seven countries Argentina, Czech Republic, Hungary, Latvia, Peru, Philippines and South Africa. ELI has incorporated a rigorous M&E component into its workplan to address such questions as

- Can a coordinated set of best-practice approaches to market intervention be effectual, implemented in a range of countries and conditions?
- Can such a program be successful at altering energy technology supply and purchasing behaviors in a significant portion of the targeted populations?
- What impacts can these changes in market conditions and behaviors be expected to have on greenhouse gas emissions reductions in the near term and into the future?
- If successful, can this type of worldwide program activity be replicated for other technologies, other markets, and other greenhouse gas mitigation strategies?

M&E Activities Guided by such questions, three major M&E activities will be carried out in each country, parallel to the project's implementation.

The **Process Evaluation** will examine the design, delivery, and follow-up processes associated with program implementation. It also provides two occasions for feedback to project implementers—during the baseline market assessment and during the midterm process evaluation. Inevitably, exogenous political, economic, or technological changes will affect implementation. This feedback builds an opportunity for analysis and modification into program implementation. It is hoped that the feedback between M&E and implementation will help create among ELI implementers a culture that emphasizes flexibility and responsibility for results rather than strict adherence to a plan.

The **Impact Evaluation** will attempt to quantify ELI's energy and environmental impacts. It will try to control for exogenous influences, such as changes in economic conditions, so that conclusions can be drawn about the specific impacts of the ELI. It will measure both direct and indirect impacts on energy consumption and then estimate greenhouse gas emissions associated with reductions in electricity generation.

The **Market Transformation Analysis** will examine the program's impact on the knowledge, behaviors, and attitudes of market actors (producers, suppliers, and end-users) and assess the extent to which changes can be sustained. This last phase of the evaluation reflects the fact that the ELI is a market transformation program. To track impacts beyond the short-term market stimulus that occurs during implementation, M&E data collection and analysis will extend several years beyond the program's end.

Training ELI also seeks to increase understanding among program implementers of the value of carefully monitoring market intervention strategies. Only by incorporating M&E practices into their programs can stakeholders determine whether their strategies worked as intended, information on project accomplishments builds support for future efforts.

Independence The ELI M&E team consists of (1) North American energy and environmental program evaluation experts leading the technical design and analysis, (2) an international market research firm with affiliates in seven countries responsible for data collection, and (3) energy efficiency/environmental experts within the seven countries, serving as liaisons for providing in-country oversight and interpretation. To keep the monitoring and evaluation free from conflicts of interest, the M&E team members have no involvement in the ELI's implementation and no stake in its outcome.

Candor Finally, the evaluation does not seek to assess individuals' performance, but rather a strategy's effectiveness at changing a market. Therefore, the evaluation seeks candor in all contacts to enable building an accurate picture of how the program has been implemented. It is only with full knowledge and understanding of conditions, barriers, actions, and outcomes that accurate assessments can be obtained, and conclusions can reached about ELI's effectiveness.

Source Adapted from "IFC/GEF Efficient Lighting Initiative (ELI) Monitoring and Evaluation Overview," which can be accessed at www.efficientlighting.net

Box 2: The Strong Cost of a Weak Evaluation: Ilumex

The Mexico High Efficiency Lighting Pilot (Ilumex) was the first of its kind to be funded by the GEF. Through the project the Mexican utility CFE leased energy-efficient compact fluorescent lamps (CFLs) to its customers. These lamps cost more than regular light bulbs but use one-quarter less energy. Though the project itself appeared to achieve good results, many questions were left unanswered and opportunities for program improvement were lost because the program's evaluation was superficial and was delayed until after the close of the program.

The implementation plan for Ilumex included a mid-term review that would provide an opportunity to fine-tune project implementation. In advance of the mid-term review, the CFE (the utility implementing the program) was to hire consultants to monitor CFL usage and assess their impact on energy consumption. But CFE did not hire the consultants in a timely manner and the World Bank, which was supervising the project, was not forceful enough in demanding that CFE proceed with the mid-term evaluation. As a result, any findings of recommendations from the mid-term review mission were largely irrelevant for project implementation and the project lost an opportunity for valuable feedback that could have helped improve its design and implementation.

Furthermore, the evaluation that did take place did not specify indicators to measure such basic parameters as cost-effectiveness, environmental impact, financial performance, and energy usage.

The World Bank's Implementation Completion Report for Ilumex lists the following as one of its key lessons learned: "The identification of appropriate project monitoring indicators and the regular collection of data by the implementing agency are essential steps in evaluating ongoing pilot project performance. Without rigorous monitoring, pilot projects' success or failure will be difficult to determine."

Source: Implementation Completion Report, Mexico High Efficiency Lighting Project, World Bank, December 1998.

Resources

GEF Project Cycle (1995): http://www.gefweb.org/public/procycle.htm

Monitoring and Evaluation of Market Development in World Bank GEF Climate Change Projects, World Bank (1998). This report can be downloaded from: http://www.gefweb.org/ResultsandImpact/Monitoring___Evaluation/M_E_Procedures/m_e_procedures.html

Martinot, Eric, and Sabrina Birner. The GEF Energy-Efficient Product Portfolio. Emerging Experience and Lessons. This report can be downloaded from http://gefweb.org/ResultsandImpact/Monitoring___Evaluation/Evaluationstudies/evaluationstudies.html

Terms of Reference for the Evaluation of the Efficient Lighting Initiative (ELI): http://www.efficientlighting.org/html/documents/evaluation/evaluation.html

Workplan for the Evaluation of the Efficient Lighting Initiative (ELI): www.efficientlighting.org
http://www.efficientlighting.org/html/documents/evaluation/evaluation.html

Evaluation of the IFC/GEF Poland Efficient Lighting Project CFL Subsidy Program Final Report, Edition 1. http://www.ifc.org/enviro/EPU/EEfficiency/PELP/pelp.htm

General information on ELI M&E: http://www.efficientlighting.org/m-and-e/index.html

Other GEF Monitoring and Evaluation Publications of Interest

The GEF Energy-Efficient Product Portfolio: Emerging Experience and Lessons is available on the GEF website (www.gefweb.org) or from the GEF Monitoring and Evaluation team. Earlier issues of *GEF Lessons Notes* can also be obtained from the website or by writing to us.

If you would like to be on the mailing list for future issues of *GEF Lessons Notes*, please contact us at the references below. Please let us know whether you wish to receive an electronic version or a hard copy, and which language (English, French, or Spanish) you would prefer.

Feedback and Suggestions

We hope the *GEF Lessons Notes* series will be a catalyst for an ongoing dialogue on what is working, what is not, and how people involved in the GEF have found solutions to challenges that face all of us. We welcome your reactions to this issue. We would also like your suggestions of topics of interest to you. Please send an e-mail to **geflessons@gefweb.org** or contact us at the coordinates listed below.

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can be an asset to a project's implementing organization, as was the case with the Thai DSM program evaluation (implemented by the Electricity Generating Authority of Thailand (EGAT), an electric utility). Many GEF projects use innovative approaches whose documentation provides guidance to future initiatives (see PELP case study). Last but not the least, M&E can inform the GEF about a project's impacts and highlight valuable experiences for a range of GEF stakeholders.

For all these reasons, the GEF requires that M&E be fully integrated into a project's development and implementation. Table 1 specifies GEF's requirements for M&E at each stage of the project cycle. This Lessons Note focuses on the Poland Efficient Lighting Project (PELP) M&E plan, draws some key lessons, and further illustrates those lessons with examples from other projects. It concludes with some practical guidance for designing an M&E plan.

Lessons Learned from the Case Study

The PELP evaluation case study sheds light on the characteristics of a good evaluation plan:

1. Monitoring and evaluation should take place before, during, and after a project.

- Before the project starts, a baseline study should be conducted to establish the "business as usual" parameters that the project is trying to change. Without a baseline, it is impossible to determine a project's impact.[3] And while there can be tension between the implementer's urge to start program activities and the delay associated with a baseline study, experience shows that the 3-6 months spent conducting a baseline study before the project begins is time well spent.
- During implementation, the parameters surveyed in the baseline study should be monitored, to yield feedback for program managers. A mid-term evaluation may also assess the process a project uses (seminars, subsidies, advertising, etc.), helping to determine whether modifications could make it more effective.
- After implementation, research should be conducted to assess the persistence of the project's impacts over time. This is especially important for market transformation programs, as they seek to have a long-term impact.

This "before, during, and after" approach is illustrated in the evaluation plan for the Efficient Lighting Initiative (ELI), as presented in Box 1. The Mexican Ilumex project provides a counterexample of the difficulties encountered when evaluation is delayed until after a project's end (see Box 2).

2. M&E should be integrated into a project's design to take advantages of opportunities for data gathering. The consumer response cards are an excellent example of how a project's fundamental activity (for example, selling lamps) can be designed to generate valuable evaluation data (for example, enclosing a consumer response card with each lamp sold). If M&E is tacked on after a project has been fully designed, such opportunities may be lost.

The ELI evaluation offers another example of the advantages of integrating M&E into a project's design. The data elements that the ELI M&E team identified for collection in market assessment surveys served both as baseline data for M&E and market data that allowed the implementation team to refine the program design.

3. Rigorous M&E that is undertaken by an independent, professional organization strengthens a project's credibility. An evaluation undertaken directly by the program implementers loses credibility. Therefore, the evaluation should be conducted by an independent and professional third party, paying careful attention to promoting good communication between the implementation and evaluation teams. Having a single organization undertake all market research ensures consistency of studies over time. If a local firm is implementing an M&E study designed by a foreign firm, questionnaires should be translated locally with special care.

The Thai DSM project, which was implemented by the Electricity Generating Authority of Thailand (EGAT), combined in-house evaluation with independent verification. EGAT conducted its own DSM program evaluation, which was then reviewed by an independent monitoring and evaluation agent. While this approach provided M&E independently verified results, it also led to some tensions around questions of cultural sensitivity.

Rigorous M&E makes the data on a program's impact more credible both within the implementing organization and vis-à-vis other institutions. M&E gave EGAT a high level of confidence in the results and helped their program gain international recognition.

4. M&E can provide valuable feedback to managers. M&E should not be a burden on project managers, nor should it be a "project police force" that creates an uncomfortable atmosphere. Rather, the M&E plan should be designed as a tool that helps managers monitor a project's evolution and empowers them to make mid-course corrections, if necessary. A close relationship between M&E and implementation can help the program be more responsive to change.

[3] Evaluation specialists distinguish between impact evaluation, whose goal is to determine the impact of a project and whose result is usually expressed in figures (GWh savings, $/ton of avoided pollutants, etc.), and process evaluation, which assesses the effectiveness of the means used by the project to achieve the goal.