Interim Process Evaluation of the Efficient Lighting Initiative: 1999-2001

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Abstract

This paper presents the interim process evaluation results of the Efficient Lighting Initiative (ELI), as presented in a report to the International Finance Corp, a division of the World Bank, in 2002[1]. The paper describes how the ELI program is being implemented in seven countries (Argentina, Peru, South Africa, Czech Republic, Latvia, Hungary, and the Philippines) and summarizes key evaluation findings from program start-up and first-year activities. The purpose of this evaluation is to provide ELI management with feedback as to the operation of the program and how the various groups involved with implementation perceive ELI.

Introduction

The Efficient Lighting Initiative (ELI) represents: (1) one of the most substantial multi-country market transformation efforts to date; (2) the first multi-country market transformation study with baseline data; (3) the first attempt at forming a global network of monitoring and evaluation (M&E) professionals; and (4) the first time M&E has been integrated into a Global Environment Facility (GEF) project from the program's inception.

Funding for the ELI Program comes from GEF, the aim of which is to assess and achieve potential for market transformation projects contributing to greenhouse gas (GHG) emissions reductions. The International Finance Corporation (IFC) acts as the executing agency for the GEF and oversees all conceptual, managerial, and implementation operations in the ELI effort.

The ELI program operates in Argentina, Peru, South Africa, Czech Republic, Latvia, Hungary, and the Philippines. For an investment of US$15 million, the ELI program has created 60 distinct, but integrated, initiatives (some with overlapping of markets) across seven countries in four regions around the globe (South America, Central Europe, Africa, and Asia). The goal of the ELI program is to transform lighting markets to accelerate the promotion and adoption of high-quality, energy-efficient lighting technologies in the residential, commercial, and municipal sectors and test the concept of multi-country implementation.

Conceptualized in the late 1990s, the ELI program began formal operation in 1999 when the countries began program implementation. The program is scheduled to run through 2003, with end dates varying by country. This paper reports on the findings of the first-year ELI program activity as based on

[1] The views and conclusions expressed in this report are those of the authors and do not necessarily represent the opinions of the project sponsors, IFC management, or the implementation entities for the Efficient Lighting Initiative.

the monitoring and evaluation (M&E) results of the program through the third quarter 2001 (Applied Energy Group et al. 2002). The M&E project started in March 2000 and ends in 2004.[2]

Program and Evaluation Design

The ELI program differs in each country according to the needs and characteristics of the marketplace, the nature of the supply chain, and the capabilities and resources of the program infrastructure. Country Managers were given significant latitude in designing programs. Each program initiative, however, fell into one of the five IFC-approved methods of market intervention (program strategies): (1) public awareness and education, (2) utility programs, (3) transaction support, (4) market aggregation, and (5) financial incentives. One or more of these programs targeted in some fashion the following key barriers to the adoption of high-efficiency lighting: (1) inadequate consumer information about efficient lighting products; (2) high first cost of efficient lighting products; (3) inadequate financing to facilitate purchases; (4) limited availability of products; (5) lack of quality standards for products; (6) split incentives between landlords/building owners and tenants; and (7) low electricity prices. All ELI participating countries worked with the IFC staff and consultants in developing program strategies that address some combination of the five program categories and seven market barriers.

The overall aim of the ELI program is market transformation. It is unlikely that the lighting market will be completely transformed in four years; however, it is anticipated that the M&E efforts in the coming years will be able to measure some progress towards market transformation, as described below. Three major M&E activities are planned, in parallel to the implementation of the ELI program itself: (1) process evaluation (see next section), (2) impact evaluation, and (3) market transformation analysis. The evaluation activities will focus on collecting information on immediate (proximate) metrics and long-term indicators, using a Result Based Management framework for structuring the evaluation. For example, immediate metrics may include: product sales (by type), product price, consumer awareness and adoption, nonresidential awareness and adoption, trade ally sector practice (stocks, retail price, etc.), professional sector practice (opinion and promotion), and manufacturer sector practice (production, quality, etc.). This information will be used to describe penetration, saturation, retention, persistence, and replacement behavior of lighting products, which will be used for measuring program impacts (e.g., energy savings, demand reduction, and reductions in greenhouse gases). Later, this information will be updated to analyze the long-term indicators of market transformation: program impacts (as noted above), and the availability and accessibility of lighting products and services (e.g., sales trends, price trends, and the practices of lighting professionals, trade allies, and manufacturers).

Process Evaluation Objectives and Strategy

The purpose of conducting an interim process evaluation is to provide ELI management with feedback that can enhance program implementation, including an assessment of how ELI is being perceived by the various groups involved with its implementation. A major part of process evaluation is to provide formal documentation as to how the program has materialized since its planning stage, as well as how and why the actual program differs from design. Factual information on how many light bulbs have been installed due to ELI influence so far was less of a concern in an interim evaluation than issues of *process:* how the program is being run and managed, what relationships have been established and how they are progressing, and how problems are being articulated and resolved. This paper

[2] Information and updates on the ELI program and the Monitoring and Evaluation project are accessible from the ELI Website, www.efficientlighting.net.

primarily addresses issues related to program operations, roles, and barriers to achievement of program goals.

The process evaluation work conducted over the first 12 months of ELI M&E activity addressed three general areas: characterizing the programs, documenting stakeholder awareness levels, behaviors and preferences, and obtaining a clear picture of the program intervention strategies being pursued by each country using ELI funding.

This evaluation is primarily based on interviews with individuals deemed most influential in the initial period of program activity, including the IFC consultants who provided direction to the Country Implementation Teams, Regional Implementation Entities, Local Implementing Authorities, and Cross-Cutting Activities staff. The evaluation also examined baseline data collected by the country teams and summarized baseline conditions as well as gaps in the data (not reported in this paper). Finally, an examination of the evaluation literature on lighting efficiency programs from prior GEF efforts included those in Poland (PELP) and Mexico (Ilumex).

The information provided in this paper is based on the research conducted in mid-late 2001. In some cases, programs were still being developed, so the assessment of the final program offerings was still subject to change. Several findings have surfaced over the initial period of operations and have already been addressed by ELI management. Others may be new or remain to be considered and addressed.

Challenges to Measurement and Evaluation

During this study, we encountered several challenges to the conduct of measurement and evaluation:

1. A larger share of project funds was devoted to monitoring and evaluation than in any previous GEF project ($900,000 for the core effort and $50,000 in each country for baseline work). Nonetheless, a lack of in-country experience, the program's complexity and reach, the diversity of countries chosen for ELI, and the country projects' variety presented special challenges to the application of conventional evaluation approaches, as discussed later in this paper.

2. The diverse mix of countries and approaches to market intervention resulted in a mixed bag of pros and cons. There was little similarity between efforts and environments, which created a continuing challenge for consistency of reporting and the hoped-for achievement of economies of scale. Developing a budget for managing the evaluation led to a focus on key areas of importance and the elimination of less important evaluation issues. However, the ultimate outcome of this approach is yet to be determined through impact and market transformation evaluation. Even so, this diversity presents a unique challenge to evaluators, particularly in terms of allocating resources for data collection and analysis for process, impact, and market transformation analyses.

3. There was a very limited energy-efficiency infrastructure in most ELI countries resulting in a steep learning curve for both local implementation and local M&E staff regarding evaluation requirements, the reasons for and benefits of market research, and good record-keeping and reporting. There were few candidates in most countries for ELI positions; especially since the IFC understandably required that implementers could also not be evaluators in the ELI program. As a result, there was significant variability in the content and quality of ELI program offerings, delays in the startup of programs, and LIE Staff turnover, along with limited local resources for M&E support. To alleviate this problem, the IFC authorized no-cost extensions of up to one year for most programs to help ensure that the initiatives had the fully intended amount of time to operate in the field. Finally, initial suspicions about the evaluation activity, while predictable, limited cooperation during

the critical market assessment completion phase. The M&E Workshop conducted at the global ELI meeting in the Czech Republic in July 2000 provided the first opportunity to conduct face-to-face training with the implementation teams. Even with improved understanding of M&E, the sheer amount of implementation work limited attention to monitoring needs for some countries.

4. The seven-country scope and various layers of management required that frequent communications be maintained: e-mail and the web site (to a limited degree) helped accomplish this, as the volume of communications was immense. The IFC management adopted a decentralized approach to project oversight, relying on a small team of seasoned energy-efficiency experts to supervise the progress of groups of countries, approve invoicing requests, and report on results. Consistency was therefore limited, as each manager was allowed to operate with some latitude regarding their approach. The IFC was somewhat constrained in its ability to devote more attention to project oversight, as each GEF project receives limited funds for project supervision by the GEF. Because of this, maximum efficiency in the use of these limited funds was of the utmost importance to ensure the achievement of project goals.

5. The collection of baseline data was difficult, due to limited previous baseline data and data collection infrastructure in many of the ELI countries. As a result, market assessments across countries were inconsistent, and key data on penetration of CFLs and other efficient lighting technologies, price, and availability were not always clear or consistent, particularly for the non-residential sectors. The large intra-country variations in equipment prices, offerings, market infrastructure, etc., made it very difficult to establish baseline and ongoing averages of important impact metrics.

6. As would be expected, maintaining continuity in a four-year project was affected by staff turnover at both the core team and in-country levels and by limited experience and expertise, in some cases. This made careful documentation of the approaches tried and lessons learned all the more critical for a program of this nature so as to minimize loss of institutional memory.

7. Related to the above point, each program took some time to identify its "champion," the person who typically provides the leadership and primary motivation for the LIE team and the one who best understands the IFC objectives and tries to keep progress on track. Having such a champion gives focus to the programs, their implementation, and communications with the M&E team. Without such a champion, programs get caught up in the design phases without clarity, without clear reporting or effective data collection.

8. A continuing challenge was the broader political and economic environments in which the programs operated, an unavoidable but sometimes critical factor in the program's ability to achieve objectives. Particularly influential in terms of contextual issues was the economic, social and political instability in Argentina and Peru. As a result, program implementation was delayed and implementation strategies had to be re-designed, and the evaluation design and implementation was also delayed and made more difficult.

9. The IFC underestimated the extent to which regulatory and governmental policies would need to be leveraged by ELI intervention to help create more favorable market conditions that would allow the goals of ELI to be realized. Activities aimed at reducing policy barriers took more resources and time than anticipated in some cases (e.g. Argentina and Peru), and virtually all countries expended some resources in this regard. Given this fact, the accomplishments of the program in reducing

market barriers were substantial and in the end may be one of the more sustaining benefits of the program.

Operational Issues

1. The IFC's funding structure resulted in a relatively complex managerial structure, whereby Regional Implementing Entities (RIEs) disbursed funds to individual country teams, or Local Implementing Entities (LIEs). It was originally intended that, in addition to serving as the funding vehicle, the RIEs would provide technical oversight and coaching, applying their previous experience in energy-efficiency program implementation. However, the role of the RIEs did not always include this function. Instead, the IFC's own core management team that interacted with the RIEs generally provided more technical assistance in some cases than originally anticipated, particularly in instances where expertise and active RIE assistance of this nature was not present.

2. One of the most successful elements of the ELI program was reflected in the constant flow of information directly between the country teams as achievements were shared, questions arose, and solutions to similar problems were sought. The ELI Website was intended to serve as a project bulletin board with different levels of access available for various purposes (i.e., open access for the public versus password-protected access for managerial functions). However, e-mail exchanges were the primary communications format, and the web site was not used much for that purpose.

Overview of Results to Date

Achievement of Goals

Most of the program activities and budgets across countries to date heavily focused on increasing **consumer awareness and acceptance**, and building the **supply chain infrastructure** for promoting high-efficiency lighting products. Depending on whether overall awareness or quality issues on lighting were the principal focus, public awareness campaigns were geared to address the barriers and key to building the market for ELI-quality products. In countries where the penetration of high-efficiency lighting was already strong among residential consumers (e.g. Philippines), efforts also focused on garnering trade ally support for increasing adoption rates of high-quality lighting, and examining non-residential market opportunities.

More challenging was the encouragement and enrollment of all potential **manufacturers**, as the large global suppliers dominated the markets and program during the initial program period. However, significant efforts during late 2000 and 2001 were made to expand the manufacturer lists participating in ELI, with relative success, in terms of achieving visibility at various levels of manufacturers' management and expanding significantly the number of manufacturers submitting applications to ELI for product qualifications.

One of the most compelling early successes of the ELI program was its highly effective use of **informational resources** to forge a virtual global program, where information was shared and lessons learned on almost a real-time basis. A very strong and congenial network of implementers and evaluators was formed across the seven participating countries, plus additional countries, including Canada, China, Denmark, Ecuador, France, Ghana, Mexico, Spain, the United States and Vietnam, whose practitioners participated in the program in some way.

This dispersed network functioned primarily because of advanced information technology – the Internet and e-mail. The daily use of these communication tools, along with frequent telephone calls,

resulted in a fairly effective management team that reached from the IFC Program Director in Washington, DC to the literal web of individuals at the implementation level of the various partner organizations. Of equal importance to the success of the electronic communications was the fact that the IFC country supervisors and regional implementation teams conducted extensive travel to establish relationships with the local teams. The IFC's convening of a global meeting of lighting manufacturers during the development of ELI, and a subsequent meeting of all ELI participants in the summer of 2000 served to further solidify relationships that were then maintained through the electronic media.

As of the time of the Interim Process Evaluation, some programs were still undergoing changes, with financial mechanisms somewhat slower than other types in taking shape. This was noted and will be re-assessed during the final evaluation.

Program Accomplishments

Several general conclusions can be made about the ELI project and its implementation in seven countries based on the results of first-year M&E activities:

1. In the four non-European countries, the initiatives started with significant consumer educational campaigns as a primary feature. The Central and Eastern European (CEE) countries, where awareness was already relatively high, focused instead on the professional sector in launching their programs. High-visibility ad campaigns in all countries seemed to be effective in getting "buy-in" and participation from consumers and stakeholders, including trade allies, government and utilities.

2. All countries pursued market intervention strategies aimed at the residential use of compact fluorescent lamps (CFLs); promotion of other technologies to either the residential sector or other market segments varied by country.

3. The three major global lighting manufacturers generally responded positively to the program, some with fairly significant actions such as making product upgrades in order to qualify for ELI approval, conducting joint marketing with participating ELI entities, frequent contact with ELI Managers, coordinating use of the ELI logo (green leaf with plug), and providing sales data to the evaluation team. Smaller manufacturers were also involved, though not as directly targeted to participate in joint marketing exercises due to their limited marketing resources, through industry associations (e.g. Philippines) and through M&E and ELI operational survey efforts in all countries, particularly South Africa.

4. The amount of effort required to identify and address legislative and regulatory hurdles to increased penetration of efficient lighting products was generally underestimated. Although it was acknowledged as part of the ELI program design, it was necessary to redirect additional ELI funds to this activity in most countries. Specifically, in Argentina and Peru, incentive program design was dependent on overcoming regulatory barriers and was thus severely delayed, requiring program redirection, when political and economic instability led to a drawn out process.

5. Establishing advisory committees comprised of various stakeholders (manufacturers, government, utilities) was a very successful way of engaging top opinion leaders in the effort that helped facilitate the reduction of barriers. Advisory committees that addressed policy and initiatives to related high-efficiency products have been useful in various international contexts both inside and outside of ELI. Some local country ELI teams were reluctant to open themselves to scrutiny because of a combination of lack of experience in implementing energy-efficiency programs and a cultural

aversion to external criticism, even when it is constructive. Having an advisory committee of stakeholders could have been helpful in retrospect, as demonstrated by the Philippines approach to capacity-building via creation of a formal entity, the Philippines Lighting Industry Association (PLIA), which undertook activities such as influencing policy on lighting imports.

Program Management Issues – IFC Consultants and Regional Implementation Entities

The process evaluation found that program management issues affected the implementation of the ELI program. This is mainly due to the diversity of countries, people, and programs and the approach that the IFC took in the program decision structure. Specifically, the IFC defined the goals of the program and provided a basic work plan, but then delegated the approach and program details to the country LIEs, who customized their work plan and implementation based on local market conditions, all under the guidance of the IFC consultants.

Clarity of Approaches, Roles and Expectations. During the initial period, the roles and expectations of management teams at the IFC consultant level were not clear. This contributed to wide variation in interpretation and implementation of these functions, along with the specific experience and expertise of the IFC staff and country reps involved. These strongly divergent approaches and interpretations in roles led to markedly different relationships and ELI experiences in the seven countries.

Variability of LIE Experience. The lack of previous experience of the local teams in conducting energy-efficiency programs, while known, led to varying time frames for the programs to gain traction.

Communication. Communication among the IFC management team (the IFC ELI Program Manager, first line of consultants) was sporadic and issue-focused. While initial conference discussions were regularly scheduled through the design phase, once programs were in the field, these communications declined and were held only on an 'as needed' basis.

Flexibility and Delegation of Program Design Approvals. The program approval process provided significant flexibility from the IFC consultant level on down. As a result, there was potential for conflict among the direction by the IFC ELI management to allow flexibility in program design, the delegation of the program approval process to the individual consultants, the lack of market transformation program design experience by the local managers, and the simultaneous expectation that all programs designed and approved would meet specific requirements. This resulted in a less focused set of initiatives. Specifically, the flexibility in program design, while positive in terms of the experimentation aspects of the program, could not ensure that specific desired market transformation techniques would be tested and would also complicate the ability of the M&E process to properly assess how market intervention strategies worked. Nonetheless, the IFC management emphasized that a primary function of the overall ELI program was to accelerate the learning process by experimenting and seeing what worked, a goal that seemed to be accomplished. In a few cases, programs were approved that could be considered as conflicting with market transformation objectives, such as those that emphasized short-term subsidies, which were permitted under the condition that they were designed to enable sustained market development. Their success in accomplishing this will be assessed by the M&E Team in its final evaluation.

Management Issues - Local Implementation Entities

The following findings apply to one or more ELI countries, but not necessarily all. They are reported here to share outcomes and results of the individual country components of the ELI program. Since the implementation model being tested is one of variability, it is instructive to identify the issues

related to individual country programs, so that future efforts can anticipate, address or preempt the issues under similar conditions.

Lack of Staff Experience and Contingency Planning. In terms of addressing critical issues and obstacles, in some countries, lack of staff experience with the promotion of energy efficiency meant that a significant learning-curve process took place to define and implement programs. It also led to weak contingency planning. For example, in Peru, a major initiative to overcome regulatory barriers took a long time and proved to be detrimental when regulatory change was not forthcoming

Fear of Failure: Cultural Issues. A cultural aversion to public acknowledgement of mistakes (common to many cultures) blocked the open discussion of issues and diminished innovative solutions. This was a sensitive issue in several ELI countries. A workshop of the evaluators helped to alleviate this concern.

Regional Efficiencies Varied. One might have expected that some cost efficiencies might have been gained by selecting countries in the same region, such as two in South America and three in the case of the Central European group. However, the relative proximity within a region did not offer many programmatic efficiencies. The differences in cultures, economic situations, and other contextual factors prevented the programs from being considered "regional." One exception to this was the coordinated product testing for both Argentina and Peru in a University lighting laboratory. Another was the way in which manufacturers interacted with the program, and the extent to which coordination of regulatory and tariff issues were realized. Opportunities may exist for increased regional treatment as the program proceeds toward its conclusion.

Advisory Committee. The creation of a stakeholder advisory committee can serve to consolidate the experience already available, if any, in the technical, implementation, and other aspects of energy-efficiency programs, for which ELI was presumed to be just the first step. This also should reduce the barriers to program implementation due to limited formal energy-efficiency infrastructure in some of the ELI countries. Involving the various stakeholders, such as trade allies, utilities, energy service companies, government, and others in the process will encourage them to actively support ELI goals. This has worked well in the Philippines as all the key participants were able to share information about their perception and knowledge of key barriers to the adoption of efficient lighting.

Next Steps

The interim evaluation indicated that ELI was on target for achieving its intended benefits. The actual extent of success is to be determined by the results of impact evaluation and market transformation assessment. Subsequent evaluation work will attempt to verify the existence and extent of the intended benefits through measurement, reasoned estimation, and analysis. The final evaluation will also examine whether, and/or to what degree and in which areas, common evaluation design elements can be implemented across a multi-country program with multiple intervention strategies.

Reference

Applied Energy Group, Inc., Marbek Resource Consultants, Ltd., and BC Hydro International/Habart & Associates. 2002. *ELI Evaluation Report, Volume 1: Summary of Findings 1999-2001*. Hauppauge, NY: Applied Energy Group.