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Implementing the CFL Toolkit

ESMAP Lighting Toolkit Helps Mexico Achieve Record-Breaking Feat

When Mexico's Trust Fund for Electricity Energy Savings introduced the [Luz Sustentable](#) (Sustainable Light) program in mid-2011, its primary aims were to promote a more efficient use of electricity, develop a vibrant market for energy efficient technologies, and contribute to global climate change mitigation efforts.

One year and 22.9 million compact fluorescent lamps (CFLs) later, Mexico had not only accomplished both goals but achieved another, unanticipated, accolade: A place in the [Guinness Book of World Records](#).

ESMAP helped make Mexico's record-breaking feat possible by producing the [CFL Toolkit](#) used by planners in the design phase of the Sustainable Light program.

The development of the CFL Toolkit began in 2008 when ESMAP concluded there was a critical mass of operational experience and

documentation from programs that had distributed more than 50 million CFLs around the world since the mid-1990s.

CFLs offer significant opportunities for developing countries to reduce energy consumption in the residential sector, thereby providing a range of major benefits to consumers, utilities, governments and the environment. But despite these outcomes, the implementation of energy efficient lighting initiatives has often been slow. Among the reasons for this have been the high cost of CFLs as compared with incandescent bulbs, negative perceptions about CFL life span and light quality, and a lack of public awareness about the environmental benefits of CFLs.

Mr. Ashok Sarkar, a Senior Energy Specialist with the World Bank involved in designing the CFL Toolkit, said ESMAP saw great potential value in producing a toolkit that distilled what

KEY ACHIEVEMENTS

45 million CFLs
distributed to 8.1 million
households

1,100 'Points of
Exchange' set up in low-
to medium-income urban
areas

Avoided emissions of
680,000 tons of CO₂
(Jan 2010—Sep 2012)

Energy Savings of
1,274 GWh
(Jan 2010—Sep 2012)

Price of CFLs declined
from US\$ 3-4 to \$2.03

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Programa Luz Sustentable

Prevé el suministro de lámparas ahorradoras, la instalación de puntos de canje, la entrega y sustitución, así como el acopio y disposición final de los focos incandescentes.



El programa busca reemplazar un total de **48 millones** de focos en el país para el año **2012** en dos etapas.

Durante este mes y en dos etapas, se incorporarán las entidades de:



Morelos, Jalisco, Guanajuato, Querétaro y Michoacán.

La sustitución de lámparas ahorradoras se llevará a cabo entregando a cada familia de menores ingresos,



En agosto, el programa será general para todo el país.



Se espera que cada foco ahorrador tenga

“We used the toolkit in order to benefit from other countries’ experiences...Knowing the design and cost of CFL programs in other countries helped us determine the appropriate scale for our own.”

Reina Velázquez
Director General of Energy Efficiency
Mexico Ministry of Energy (SENER)

had worked—and failed—in rolling out large-scale CFL campaigns in the past.

“CFL programs had had their share of successes and difficulties over the years, and these provided a substantial storehouse of implementation experience,” Mr. Sarkar said. “We felt a toolkit could synthesize these experiences and help developing countries improve the design and implementation of energy efficient lighting programs in the future.”

ESMAP set about assessing the structure, financing, and implementation elements of CFL programs carried out by the World Bank and other organizations over the previous two decades.

The result was a user-friendly, web-based toolkit that provided a wide range of easily adaptable operational documents. These included procurement guidelines, technical specifications, supply contracts, consumer surveys, lists of suppliers and products, awareness-raising material, and environmental and safety information. The toolkit also provided advice on how CFL programs could be made eligible for funding from the [Clean Technology Fund](#) (CTF), the [Global Environment Facility](#) (GEF), and other sources of climate financing.

The toolkit was completed in 2009 and soon came to the attention of the Mexican government, which at the time was embarking on an aggressive energy efficiency program as part of its newly launched Special Climate Change Program ([Programa Especial de Cambio Climático](#), or PECC).

Mexico is the second largest emitter of greenhouse gases (GHGs) in Latin America and ranks 12th in the world in terms of total GHG emissions. The PECC identified a range of climate change interventions, quantifying the potential impact and cost of each in terms of policy, regulation, and technology adoption. The program also set the target of a 50 percent reduction from 2000 GHG emission levels by 2050.

Energy consumption in Mexico’s residential sector had been growing faster than GDP in recent years, and with households accounting for an estimated 27 percent of total electricity use—and with more than 80 percent of homes still using incandescent bulbs—the PECC saw a nation-wide CFL exchange program as an ideal means of achieving significant GHG emission reductions.

Mr. Sarkar recalls presenting ESMAP’s CFL Toolkit to planners at Mexico’s Ministry of Energy (SENER).

“The SENER planners took a look at the toolkit and said, ‘The World Bank has already done all this? Then we can rely on you to help us design our own CFL program!’”

“CFL programs had had their share of successes and difficulties in the past...We felt a toolkit could synthesize these experiences and help developing countries improve the structure of their energy efficient lighting programs.”

Ashok Sarkar
Senior Energy Specialist
The World Bank

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Ms. Reina Velázquez, the Director General of Energy Efficiency at SENER who was responsible for the oversight of the Luz Sustentable Program, said the toolkit was used in order to benefit from other countries' experiences.

"Knowing the design and cost of CFL programs implemented elsewhere helped us determine the appropriate scale of our own," she said.

ESMAP also helped SENER develop an "integrated" supply and distribution contract to overcome the supply chain problems that often hindered implementation of CFL programs. Instead of contracting with numerous partners along a supply chain, the integrated contract mandated that a single service provider be responsible for the acquisition and distribution of CFLs, the exchange of CFLs for incandescent bulbs, the awareness campaign that would accompany the program, and the collection and appropriate disposal of old incandescent bulbs.

With this approach, the winning bidder of the Sustainable Light distribution contract had the option to design its own supply and delivery scheme and, therefore, avail of the opportunity to cut costs by capturing economies of scale from a bundled process.

Ms. Velazquez said the integrated contract also allowed SENER to ensure that the CFL's reaching Mexican households were of the highest quality and available at the most competitive price. The bidding process for the CFL contract included high quality technical specifications. In addition, the private sector Trust Fund for Electricity Energy Savings was tasked with ensuring technical verification and supervising the distribution process, sending regular updates to SENER.

"We established a high standard for our CFLs because we had only one chance to demonstrate how well they actually worked," Ms. Velasquez said. "The integrated approach enabled us to monitor our CFLs from the place of manufacture to the point of

exchange."

The integrated supply contract was used in the Efficient Lighting and Appliances Project launched by the World Bank in 2011. The project, supported by a US\$ 250 million World Bank loan along with financing from the CTF and GEF, aimed to help Mexico promote the efficient use of energy and mitigate climate change by increasing the use of energy efficient technologies at the residential level.

The Efficient Lighting and Appliances Project had three components, the first of which was the program to replace incandescent bulbs with CFLs. The second component launched a nationwide scheme to help households replace inefficient air conditioners and refrigerators with energy efficient alternatives, and the third was an initiative to strengthen SENER's capacity to design and implement energy efficiency activities, which included information and awareness campaigns, studies, and training.

For the launch of the Sustainable Light program, more than 1,100 "points of exchange" were set up in low- to medium-income urban areas throughout the country. In order to obtain four new CFL bulbs, eligible participants needed only to bring a recent electricity bill, a form of identification, and four incandescent bulbs to be disposed of following approved regulatory procedures.

According to SENER estimates, the 22.9 million CFL's distributed during the first phase of the Sustainable Light program had an immediate impact on more than 5.5 million Mexican families. On a national level, the net decline in energy consumption translated into lower quantities of fuel needed to generate electricity, and, thus, lower GHG emissions. SENER estimated that the replacement of incandescent bulbs resulted in energy savings of 1,274 GWh and avoided emissions of 680,000 tons of CO₂ between January 2010 and September 2012.

Ms. Velazquez said the feedback from CFL recipients had been



largely positive. “People have been responsive to the lower cost of CFLs and pleasantly surprised by their quality,” she said.

Thanks to the integrated supply chain, the total cost of the Sustainable Light CFLs was equivalent to US\$ 2.03 per lamp, less than half the price of similar CFLs for sale in the Mexico City area. Since its inception, the Sustainable Light program in Mexico has expanded and gone on to distribute a total of 45 million CFLs, reaching more than 8.1 million households across the country.

ESMAP’s CFL Toolkit has subsequently informed World Bank projects in Armenia, Bangladesh, Burundi, China, India, Mali, and Thailand, and has been used by external partners such as the UK Department for International Development.

Mr. Sarkar said the toolkit’s adaptability has enabled the design of larger projects that planners can implement with less preparation time. “The toolkit has been beneficial in helping planners use existing technical specifications and distribution agreements instead of having to produce new ones,” he said.

In 2011, the toolkit designers at ESMAP received the World Bank’s Sustainable Development Network (SDN) team award. In announcing the decision, the SDN cited the toolkit’s “transformational impact” in implementing large-scale, energy efficient lighting programs, which in turn led to “quick and significant energy efficiency gains, changed consumers’ behavior, and a reduction in GHG emissions” around the world.



ESMAP MISSION

The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Denmark, Finland, France, Germany, Iceland, Lithuania, the Netherlands, Norway, Sweden, and the United Kingdom, as well as the World Bank.

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