

Short-Term Approaches to Address Electricity Shortages

Presentation to MEMD

The World Bank

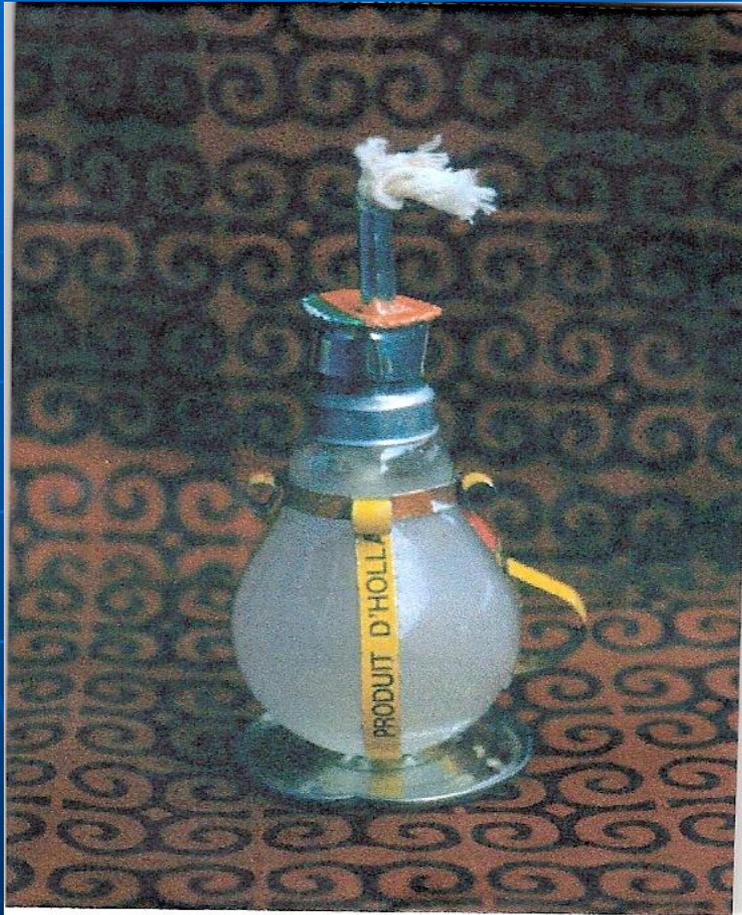
April 28, 2006

List of Programs

- Energy Saver Lamps (CFL)
- Installation of Capacitors
- Efficient Street Lighting
- Solar Water Heating

Energy Saver Lamps (CFL)

Our Energy Future...the Path is Clear...



Electric incandescent lamp converted into a fuel oil lamp
from Ghana marketplace (Source: Evan Mills, 2002 [Photo Credit: Rick Wilk])

OR



CFL Program - Scale

Customer Category	Estimated Number of Lamps per Customer	Number of Customers	Total Number of Lamps incl. fluorescent tubes
Tier 1 (low income residential)	1-2	76,000	114,000
Tier 2 (middle-income residential)	2-4	78,000	234,000
Tier 3 (high-income residential)	6 to 8	21,000	147,000
Tier 4 (high-income res. + small commercial)	8 to 12	35,500	355,000
Total		220,500	850,000

Number of Lamps that are used for 4+ hours/day

Scale

- Estimated number of CFLs being sold annually: 100,000+
- Estimated number of Incandescents being sold annually: 1.5 million, that translates into 500,000 to 600,000 CFLs
- CFL deployment targeted at this market of 500,000- 600,000 lamps

Project Approach

- 600,000 CFLs for free installation
- 50,000 provision for free replacement under warranty
- 150,000 for post-warranty replacement **sales**
- Total bulk procurement – 800,000
- Bulk Procurement by UMEME using technical specifications based on ELI
- Single supplier or multiple suppliers (to be decided)
- Distribution through either UMEME or supplier retail channels

Benefits of Project Approach

- Bulk procurement will bring cost down
- Assured way of getting fast contribution to load reduction
- Technical specifications will assure product quality
- Warranty will provide comfort to customers
- Injecting large number of lamps in the market will help market development
- Customer experience plus post-warranty replacement sales will lead to future purchase decisions
- Build up customer confidence and CFL image which will lead to increased market acceptance

Reducing CFL Costs and Increasing Penetration

Bulk Procurement without Cost Recovery	ESKOM-South Africa (5 million)
Bulk Procurement with Cost Recovery	EVN-Vietnam (1 million) ECG-Ghana (4 million/yr)
Branding with Cooperative Advertising & Promotion	BESCOM-India (400,000) CEB-Sri Lanka (600,000)
Removal of Duties and Taxes	India, Sri Lanka

Program Benefits

Utility Perspective

- Peak Load Savings per CFL = 48 W
- Cost of Peak Load Saving = \$10 per kW per year compared to \$40 to \$200 for supply options
- Total Savings = 28 to 30 MW

Customer Perspective (Free CFL)

- Energy savings per CFL per day = 192 watt-hours
- Energy savings per CFL over lifetime = 280 kWh
- Bill Savings per month = US\$0.70

(Paid CFL)

- Payback period ~ 3 months (at today's tariff)
- Bill Savings/mo/CFL = \$0.70

Key Program Features

- Technical Specifications (life, voltage tolerance, lumens/watt, etc.)- international standards available from ELI
- Warranty
- Awareness and promotion
- Elimination of duties and taxes
- Monitoring and Evaluation
- Sustainability

Example of CFL Promotion Program Mascot - BELP



Hologram

Lighting up your life – efficiently ...

Installation of Capacitors

Capacitors

- Power factor compensation through installation of capacitors
- Targeted for industrial, institutional and large commercial customers
- UMEME study of 94 large customers
- Observed power factor ranges from 0.6 to 0.95
- Of total of 86 MW load, 76% are below 0.9 PF
- Target of power factor (international utility best practice) = 0.95+
- Estimated savings of about 10 to 20 MW just for these 94 customers

Program Options

- Install capacitor banks at industrial, institutional and large commercial customers
- Additional network analysis of required – install electronic energy meters with half hourly load profiles to measure kW, kVAr (lag), kVAr (lead), kVA, and power factor or do a quick energy audit
- UMEME has already initiated the assessment work on some feeders and large industrial customers
- In the future, introduce two-part tariffs (for both kWh energy and kVAr demand)

Street Lighting

Streetlighting

Current System

- Mercury Vapor Lamp
- Typical Wattages – 125 and 250 watts per lamp

Alternatives

- High Pressure sodium (HPS)
- CFL
- CFL with Solar PV

Advantages of Alternatives

- Energy savings
- Longer Lifetimes

Solar PV-CFL Street Light



Street Light

- Dusk to Dawn Operation
- Fully Automatic
- Wall Mountable
- Rugged Design
- 4 Mtr. Pole

Solar Water Heating

Market Characteristics

No. of Customers with Water Heating	40,000 to 50,000
Number of SWH Systems Installed	1000 to 1500
Number of Suppliers in the Marketplace	2
Typical System Sizes	150 to 300 liters
Typical System Costs	Ush 2.4 to 3.6 million
Typical Simple Paybacks	4 to 5 years

Program Options

- Provide a subsidy to manufacturers/suppliers or customers to help reduce the system costs
- Extend the existing PSF Credit Support Facility to SWH systems
- Develop a low-cost financing program to facilitate customer purchase using a “pay from savings” concept (similar to PSF program for PV)
- Undertake an intensive awareness and promotion campaign
- Require SWH systems to be installed on all new homes over a certain size.

Thank you

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