

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

“Distribution of energy efficient light bulbs in public and private sectors of Ukraine”

CONTENTS

A. General project and monitoring information	2
B. Key monitoring activities	6
C. Calculation of GHG emission reductions	10

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

Key Abbreviations/Terminologies

AIE	Accredited Independent Entity
CFL	Compact Fluorescent Lamp
ERU	Emission Reduction Unit
GHG	Greenhouse Gas
JI	Joint Implementation
PDD	Project Design Document
PSG	Project Sample Group

SECTION A. General project and monitoring information

A.1. Title of the project:

Distribution of energy efficient light bulbs in public and private sectors of Ukraine

A.2. JI registration number:

JI 0254

A.3. Sectoral scope:

3: Energy demand

A.4. Short description of the project activity:

The proposed joint implementation (JI) project involves distribution of energy efficient light bulbs to various customers from public and private sectors. The project is conducted within the geographical boundaries of Ukraine and it will be implemented and managed by PRIMLIGHT, LLC.

The goal of the project is to enhance the energy efficiency of Ukraine's lighting stock by distributing over a period of 14 years up to 210,926,791 compact fluorescent lamps (CFLs) to Ukrainian customers from private, as well as from public sectors. By doing so, the project abates greenhouse gas (GHG) emissions through avoided electricity usage, significantly reduces national electricity demand and stress on energy infrastructure, and saves customer's money on their electricity bills.

Although CFLs were introduced to the Ukrainian market as early as 2004, they have failed to replace incandescent lamps as the largest component of the Ukrainian lighting stock. Moreover, the sales of incandescent lamps accelerated during 2009 and 2010. The ubiquity of incandescent lamps is attributed to their low cost combined with the relatively low wealth level of an average Ukrainian citizen (in 2010, the average consolidated financial wealth per Ukrainian adult was equal to 947 USD)¹.

Under the proposed JI project scheme, quality self-ballasted CFLs are distributed to residential households, as well as to industrial, commercial and government organizations. Once the CFLs have reached their end of life, or any CFLs which have failed prematurely during the project period, the project team would arrange for the collection and disposal of CFLs as per applicable environmental norms.

In order to create a rapid uptake of CFL use, the proposed JI project utilises one of two types of incentives or their combination:

1) Discount;

The customers receive CFLs free of charge or at a heavily discounted price.

2) Rebate;

The customers pay full price of CFLs upfront and then are reimbursed gradually after certain time periods in several instalments.

The incentives can vary for different types of consumers according to the marketing policies of the project, and can be up to 50% or free of charge. In any case, the average (of all CFLs distributed within the project for any given year) incentive will be no less than 20% of the average market price of a CFL for that particular year. If in the future this condition is not met, the project owner will re-evaluate the additionality of the project.

To bridge the cost differential between the market price of the CFLs and the price at which they are distributed to the consumers, the JI mechanisms of Kyoto Protocol are harnessed. The project owner covers the project cost through sale of GHG emission reductions.

Apart from the direct financial benefit to the project participants in terms of savings on their electricity bills each year, the proposed JI project activity will also generate a range of less tangible social outcomes in education, awareness and collateral energy saving measures. This energy efficiency project will create an opportunity for collective action on climate change, enhancing a sense of responsibility for the future of our planet.

A.5. Monitoring period:

¹ Global Wealth Databook, Research Institute of Credit Suisse, 2010, p. 72.

- Monitoring period starts on 01.01.2008 at 00:00
- Monitoring period ends on 31. 12. 2010 at 00:00

A.6. Intended deviations or revisions to the determined PDD

N/A

A.7. Intended deviations or revisions to the determined monitoring plan

The monitoring databases for the above mentioned period has been drafted by two entities, namely “Gazotron –Lux” Ltd (database A) and SLR “Trading Company Lummax” (database B). The CFLs from their databases clearly traceable and totally different which excludes double counting. Monitoring of CFLs from these databases can be conducted independently and the data from one database does not influence the data from the other. The entities have two separate PSGs and separate measuring equipment. The selections of representatives for both PSGs are consistent with the selection outlined in the monitoring plan. They are formed from separate representatives that under no circumstances can be duplicated. The rest of the monitoring plan, outlined in PDD and reviewed by AIE, has not been changed..

The times of submitting the monitoring databases by above mentioned entities do not co-inside. Consequently, there is overlapping. The project team argues that in view of the above arguments and in view of “Clarification regarding overlapping monitoring periods under the verification procedure under the Joint Implementation Supervisory Committee”² this overlapping is reasonably justified.

This monitoring report is based on database A (prepared by Gazotron –Lux). The data from the database B, prepared by Lummax, will be included in the next monitoring report.

A.8. Changes since last verification

Not applicable

A.9. Person(s) responsible for the preparation and submission of the monitoring report

Table 1: Responsible for the preparation and submission of the monitoring report

² <http://ji.unfccc.int/Ref/Guida/index.html>

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

Distribution of energy efficient light bulbs in public and private sectors of Ukraine

5

Organisation:	PRIMLIGHT, LLC
Street/P.O.Box:	Shkilna Street
Building:	25-A, Office #10-A
City:	Petropavlivska Borschagivka
State/Region:	Kiev Region
Postal code:	08130
Country:	Ukraine
Phone:	38 067 231 19 29
Fax:	
E-mail:	
URL:	
Represented by:	George Tikhonov
Title:	Vice - CEO
Salutation:	
Last name:	George
Middle name:	Andrianovich
First name:	Tikhonov
Department:	
Phone (direct):	
Fax (direct):	
Mobile:	38 067 231 19 29
Personal e-mail:	tga@lummax.kiev.ua

SECTION B. Key monitoring activities

B. 1. Project implementation status

The project activity started on 26.11.2007. The project currently at the phase of distribution of CFLs, combined with monitoring activity (please see PDD section A.4.2. and corresponding diagram – figure2). Apart from overlapping described in section A.7. of this report, there have been no special events or amendments to project activities.

B. 2. Monitoring plan

The key points of monitoring plan are listed below.

Collection of CFL Nameplate Data

The project coordinator keeps a record of the power rating of the CFLs distributed during the project activity and uses this to determine the weighted average power rating for the project devices. CFLs distributed under the JI project are marked with a logo and serial number to ensure that they can be unambiguously differentiated from other light bulbs.

Monitoring Use of Project Devices

Monitoring a sample of distributed CFLs to determine average hours of utilisation or total energy consumption has been undertaken by installing metering equipment to consumers belonging to the Project Sample Group (PSG). PSG size is 100 participants.

The annual operating hours of monitored devices are used to determine the energy baseline. The average hours of use of light bulbs found in the PSG are directly extrapolated to all consumers involved in the project. The purpose of establishing the PSG is to create a *representative sample* of all other project consumers. It is not possible to monitor *all* consumers involved in the project, and it is a fundamentally agreed scientific and statistical procedure to apply mean values obtained through sampling to the broader population. Therefore, for each monitoring period a mean value is obtained for the time of use t_y^{on} then statistically corrected to a confidence level of 95% (similar to AM0046 version 2), and extrapolated across the total number of bulbs $Q_{j,y}$ operating during that monitoring period. This is used in the calculations of emission reductions as stipulated in the equations provided in section C below.

Establishment of Project Sample Group

The procedure to determine the sample of CFLs ensures that they adequately represent the broader population, minimizing sampling error. Given that participation in the project is voluntary, determination of the exact population of participating consumers prior to establishment of the PSG is not possible. In addition, because the project coordinator cannot force consumers to participate in sample groups, the devices monitored in the resulting sample are to a degree, self-selected rather than purely

random. Despite these limitations, the project owner ensures that devices sampled are representative of the broader population of measures in participating consumers.

As discussed above, the results obtained from the sampling process are directly extrapolated across the entire population of consumers participating in the project. Therefore, the proportion of CFLs installed at PSG and continuing to function as determined through the check is taken to be representative of the pattern occurring to all consumers.

Project Database

The project owner develops and manages a project database that records all information relevant to project activities and monitoring, including:

- A list of participating consumers, including information to identify consumers by name and address.
- A record of the CFLs (date, number, type and power) provided to each consumer.
- A list of participants included in the PSG, including information to identify participants (name, address and date added to the sample group).
- The following data relating to monitored CFLs and equipment:
 - o Identification number for each piece of equipment;
 - o Type of monitoring equipment and date of installation;
 - o Confirmation at each check that monitoring equipment is functioning;
 - o Confirmation at each check that the monitored CFL is functioning;
 - o Utilization data (hours of use and/or electricity consumption).

B.3. Operational and management structure that the project owner will apply in implementing the monitoring plan

The project team will organise:

- The establishment of transparent systems for the collection, computation and storage of data, including adequate record keeping and data monitoring systems;
- Database system administration;
- Calculation and reporting of ERUs generated by the project activities.

The proposed project involves a range of operational activities. In order to effectively implement and manage the project, these operations have been divided into seven broad categories and defined the management responsibilities for each as detailed in the table below:

Table 2: Operational categories and management responsibilities of the project

Operational Category	Management Responsibilities and Arrangements
Product Supply	- Ensure timely production and supply of CFLs for the project
Transport and Storage Logistics	- Arrange transport of CFLs from the supply partner - Arrange storage prior to distribution - Delivery of CFLs to distribution hubs
Distribution of CFL	- Management of stock and customer transactions - Company data collection
Data Management	- Management of the database of distributed CFLs
Monitoring Emission Reductions	- Selection & recruitment of sample groups - Periodic collection of monitoring data - Preparation of monitoring reports for emission reduction verification
End-of-life Product Disposal	- Arrangement and management of proper bookkeeping and disposal of end-of-life CFLs

Responsibilities of the monitoring team are presented in the following table.

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

Table 3: Personnel responsible for monitoring

Responsibility	Staff
General guidance	Vice- CEO (Primlight)
Selection & recruitment of sample groups	Sales managers (Gazotron-Lux)
Periodic collection of monitoring data	Sales managers ((Gazotron-Lux)
Data base maintenance	Financial Director (Gazotron-Lux)
Preparation of monitoring reports for emission reduction verification	Head Analyst (Primlight)

SECTION C. Calculation of GHG emission reductions

The GHG reduction emissions are achieved due to difference in energy consumption between CFLs and incandescent lamps. Power consumption conversion table presented below:

Table 4: Conversion table between incandescent and fluorescent lamp power outputs

Incandescent	CFL	Wattage difference
500	105	395
300	68	232
200	55	145
150	40	110
120	30	90
	32	88
100	20	80
	23	77
75	16	59
	18	57
60	13	47
	15	45
40	9	31
	11	29
25	5	20
	7	18

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

The data variables used for emission reductions are presented in the following table:

Table 5: Data variables

Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How is the data be archived? (electronic/ paper)	Comment
S Total number of CFLs distributed	Project data base	pieces	m	Real time continuous recording	100%	Electronic	Direct counting
\hat{t}^{on} Average operating hours	Metering devices of the sample group	hours	m	Monitored continuously with annual recording and aggregation	Project sample group	Electronic and paper	
Q The number of operational CFLs	Checks of the sample group and distribution functions of different types of CFLs	pieces	m	Monitored continuously with annual recording and aggregation	Project sample group	Electronic and paper	

JOINT IMPLEMENTATION PROJECT MONITORING REPORT

Distribution of energy efficient light bulbs in public and private sectors of Ukraine

<i>k</i> Wattage difference between CFL and corresponding incandescent lamps	Direct counting	Watts	m/e	Real time continuous recording	100%	Electronic and paper	Please refer to table #3
$EF_{CO_2,ELEC}$ Emission factor	State Environmental Investment Agency of Ukraine	tons of CO ₂ equivalent / megawatt hours	Not applicable	Published annually by State Environmental Investment Agency of Ukraine	Not applicable	Electronic	As soon as a new baseline emission factor of the Ukrainian electricity system is published, the project owner will make appropriate modifications of emission reduction calculations at the stage of monitoring report development

Calculations of GHG emission reductions is divided in three steps:

Step1 Calculation of hours of utilization

Average operating time of CFLs $t_{i,y}^{on}$ during period y , adjusted to 95% confidence interval and measurement error is based on readings of measuring devices from PSG. The detailed calculations of the average operating time is given in Excel file presented to the verification team.

Step 2 Calculation of net electricity saving

$$NES_y = \sum_{j=1}^m Q_{j,y} \cdot k_j \cdot t_y^{on} / 1,000,000 \quad (1)$$

Where

m number of types of CFLs,

k_j wattage difference between CFL and corresponding incandescent lamp (as per conversion table 4) i.e. difference between project and baseline scenario (*Watts*),

t_y^{on} average operating time of CFLs during period y (*hours*),

$Q_{j,y}$ number of operational CFLs of type j during monitoring period y .

The detailed calculation of the electricity saving is given in a separate Excel file which has been presented to the verification team.

The final electricity saving for the first monitoring period is:

$$NES_1 = 169\,300 \text{ megawatt-hours}$$

Step 3 Calculation of total emission reductions

$$ER_y = NES_y \cdot EF_{CO_2,ELEC,y} \quad (2)$$

Where

NES_y - net electricity saving for period y (megawatt* hours),

$EF_{CO_2,ELEC,y}$ - emission factor (tons of CO_2 equivalent /megawatt* hours).

The detailed calculation of the emission reduction is given in a separate Excel file which has been presented to the verification team.

The final emission reduction for the first monitoring period is:

$ER_1 = 207\,920$ tons of CO_2 equivalent

With the yearly breakdown :

Year	Reduction (ex-ante)	Reduction (monitored)
2008	57 689	30 596
2009	178 997	69 846
2010	275 432	107 478
Total	512 118	207 920

The relatively large discrepancy between the *ex ante* reduction and the reduction claimed in this report is attributed to the fact that only a portion of total reduction is claimed. The rest of it will be claimed in the next monitoring report as described in section A.7.