JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
Version 01 - in effect as of: 15 June 2006

CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:
>>
Title: Distribution of energy efficient light bulbs in public and private sectors of Ukraine
Sectoral scope: 3 (Energy demand)
Version: 01.5
Date: 21/05/2011

A.2. Description of the project:
>>
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
SSL	Solid State Lighting

The proposed joint implementation (JI) project involves distribution of energy efficient light bulbs to various customers from public and private sectors. The project will be 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 will abate greenhouse gas (GHG) emissions through avoided electricity usage, significantly reduce national electricity demand and stress on energy infrastructure, and save 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 would be 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 will utilise one of two types of incentives or their combination:

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

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 would cover 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.3. Project participants:

>>
PRIMLIGHT, LLC will be the official project owner and managing entity and the responsible body for all administrative affairs of the involved parties in host and investor countries.
Detailed contact information of these parties and further involved parties is included in annex 1.

Project participants are defined as either:
1. a party involved, which has indicated to be a project participant, or
2. a private and/or public entity authorized by a Party involved to participate in a JI project activity.

Party involved *	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ukraine (host)	• PRIMLIGHT, LLC	No
Switzerland	• PROMOSURA, AG	No

A.4. Technical description of the project:

A.4.1. Location of the project:

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The proposed JI project is located within the national borders of Ukraine. Ukraine, with its area of 603,628 km^2, is the second most populated country in Eastern Europe. Ukraine is divided into 24 provinces, one autonomous republic, i.e. Crimea and two cities with special statuses, i.e. Kyiv and Sevastopol.

A.4.1.1. Host Party(ies):

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Ukraine. Ukraine has ratified Kyoto Protocol to UN Framework Convention as of the 4th of February, 2004, is listed among the countries in Annex 1, and meets the JI project requirements.

A.4.1.2. Region/State/Province etc.:

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All regions/provinces of Ukraine.

A.4.1.3. City/Town/Community etc.:

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All Ukrainian cities, towns and villages.

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

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The project location is in Ukraine. PRIMLIGHT LLC, the project owner, is located at the following address:
Shkilna Street
25-A, #10-A
Petropavlivska Borschagivka
Kiev region 08130
Ukraine

Figure 1: Geographical boundary of the project

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

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The proposed activity will involve distribution and installation of CFLs for use in public and private sectors of Ukraine. Energy efficient light bulbs, in this case CFLs, will be made available for:
1. Households (individuals);
2. Industrial, commercial, institutional and government organizations (legal entities).

Accordingly, there will be two types of activities, namely CFL distribution to households and CFL distribution to legal entities.

1. **Distribution to individual households**

Under the proposed JI project scheme, quality selfballasted long-life CFLs would be distributed to grid-connected residential households. The distribution of CFLs or replacement of previously used incandescent lamps with |CFLs in households in the project area can take place using one or more of the following methods:

• direct installation of CFLs at each household; and/or
• CFL distribution through dedicated distribution points located at retail outlets, residence maintenance offices, etc.

The maximum number of lamps that one household can receive is capped according to the marketing policies of the project. This restriction is supposed to prevent abusing the conditions of the project and reselling project CFLs. The maximum power output of CFLs distributed to households is capped at 23Watts (100 W equal) similar to AM0046, v.2.0.

2. **Distribution to legal entities**

After studying lighting needs of a particular organization, an individual agreement will be signed with each organization for delivery exchange and utilization of CFLs. There will be no restrictions as to the number of CFLs exchanged and installed and there will be no cap as to the CFL power output.

A project coordinator is appointed to organise all requirements according to the project plan and to supervise all involved bodies.

The expected timeline for all activities is summarised in the following diagram.

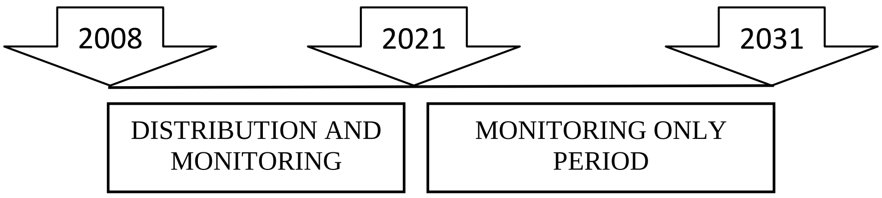

Figure 2: The expected timeline of the project

In the following several paragraphs we describe technological details of the project.

Incandescent lamps generate light by passing electric current through a resistive filament, thereby heating the filament to a very high temperature so that it glows and emits visible light. Incandescent light is highly inefficient, as about 98% of the energy input is emitted as heat. CFLs work by passing electricity through mercury vapour, which in turn emits ultraviolet light. The ultraviolet light is then absorbed by a phosphor coating inside the lamp, causing it to glow, or fluoresce. CFLs require up to 80% less energy than incandescent bulbs to produce an equivalent lumen output and last up to 15 times longer than standard incandescent bulbs. Replacing incandescent bulbs with CFLs results in significant reductions in electricity use for lighting, thereby reducing energy demand, cutting GHG emissions associated with the production of electricity and saving household's money on their electricity bills.

Quantity of GHG emissions varies directly with efficiency of the lighting device, therefore the device itself, namely the light bulb should be considered as the direct source that causing GHG emissions.

Summary of project CFL technical characteristics is presented in the following table.

Table 1: Summary of technical characteristics of CFLs used for the project

Characteristic	Units	Value
Nominal voltage	Volt	220
Nominal frequency	Hertz	50
Operational voltage range	Volt	198-242
Operational temperature range	^{O}Celsius	-20 - +40
Colour temperature	^{O}Kelvin	2700 (warm white) 4000 (cool white) 6400 (daylight)
Luminous efficacy	Lumens per watt	>45

It is anticipated that the CFLs provided to customers within the project will have a lifetime from 6 000 to 15 000 hours of use, and have rated power outputs in the range from 5W to 105W (an equivalent in lumen output to incandescent bulbs from 25W to 500W respectively). The conversion table of incandescent-CFL power outputs is presented below:

Table 2: 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

The difference between the CFL lumen output and incandescent lumen output will not exceed ±10% of the CFL output.

All CFLs utilised within the project comply with international and national standards of manufacturing and labeling (ISO 9001:2008, DSTU ISO 9001:2009, DSTU IEC 60968-2001, DSTU CISPR 15:2007). They also comply with technical regulations (Technical regulation on the energy efficiency labeling scheme, technical regulation on electromagnetic compatibility, etc.) In addition to the standard labelling, a unique project logo will be printed on each CFL (below).

CO_2 JI
Not for resale

Figure 3: The project logo

The technology that has initially been envisaged for the project is CFL technology. However, there is another energy efficient lighting technology that hypothetically can be utilised within the project. It is solid state lighting (SSL). SSL uses light-emitting diodes as sources of illumination rather than electrical filaments, plasma or gas. At the time of writing this document, the SSLs are about as energy efficient as CFLs, but more expensive. If at any stage of the project, the SSL technology improves to match CFL, or any new comparable technology emerges, we might opt to distribute energy efficient lamps different from CFLs.

A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances:

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The proposed project is expected to improve the lighting efficiency country wide. As the result of that, the project will achieve CO_2 emission reduction by saving electricity consumption generated by the fossil fuel based power plants.

The proposed project is a voluntary and coordinated action. In addition, the project requires individual consumers to take voluntary action to participate in project activities.

Additionality of the proposed project is detailed in section B.2. by means of "Combined tool to identify the baseline scenario and demonstrate additionality " version (03.0.0) dated by the 15th of April, 2011.

A.4.3.1. Estimated amount of emission reductions over the crediting period:

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The total crediting period is from 01/01/2008 to 31/01/2031 which is divided in two periods (the first commitment and post-Kyoto period):

1. 01/01/2008-31/12/2012
2. 01/01/2013-31/01/2031

Consequently the estimates of emission reductions organized in two tables:

Table 3: Estimated amount of emission reductions (01/01/2008-31/12/2012)

	Years
Length of the crediting period	five
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	57 689
2009	178 997
2010	275 432
2011	741 088
2012	2 239 432
Total estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	3 492 638
Annual average of estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	698 528

Table 4: Estimated amount of emission reductions (01/01/2013-31/12/2031)

	Years
Length of the crediting period	nineteen
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	4 364 925
2014	6 442 554
2015	8 435 318
2016	10 265 311
2017	11 817 463
2018	12 981 745
2019	13 711 463
2020	14 045 138
2021	14 156 352
2022	13 092 580
2023	10 939 195
2024	8 807 344
2025	6 718 561
2026	4 737 447
2027	2 971 671
2028	1 593 504
2029	646 015
2030	193 804
2031	21 533
Total estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	145 941 923
Annual average of estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	7 681 154

For the total crediting period (01/01/2008 to 31/01/2031):

- Total estimated emission reductions – 149 434 561 (tonnes of CO2 equivalent).

- Annual average of estimated emission reductions -6 226 440 (tonnes of CO2 equivalent).

Assumptions and parameters used for the calculations of the above tables are presented in annex4.

A.5. Project approval by the Parties involved:

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The project has been officially presented for an approval to the Ukrainian authorities and it has been endorsed. The number of the Letter of Endorsement of the State Environmental Investment Agency of Ukraine is 2519/23/7 dated by 13.09.2011. The Letter of Approval is supposed to be issued by the State Environmental Investment Agency after completion of the determination process.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

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The baseline scenario of the proposed project is assumed to be a continuation of current practice which involves purchase and use of incandescent lamps on a large scale, and related GHG emissions that would have occurred in case the project would not be implemented and the replacement of general lighting bulbs by CFLs would not take place. The baseline therefore is the predominant use of standard incandescent lamps with wattages in a range from 25 to 500 watts. The brakedown (for Ukraine) of wattages is illustrated in table 5.

Table 5: Incandescent lamp wattage breakdown

Power (W)	Breakdown
500	<1%
300	1%
200	1%
150	2%
100	39%
75	31%
60	19%
40	6%
25	1%
84.3	**Baseline (average)**

The project development team is using option 2 (please see sections D.1.1.3. та D.1.2.), that is why parameters for formal calculations of baseline emissions are not necessary.

Additional justification of a continuation of current situation as the most plausible baseline scenario using one of UNFCCC's baseline methodological tools is given in the following section (B.2.).

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

>>
The project owner has opted for JI specific approach. The latest version (03.0.0 by 15.04.2011) of UNFCCC's "Combined tool to identify the baseline scenario and demonstrate additionality "[2] is used as the basis for the determination of the additionality. The tool is applicable to a wide range of project types, and it provides for a step-wise approach to demonstrate additionality and simultaneously to identify the baseline scenario. Four steps of the tool are as follows:

STEP 1. Identification of alternative scenarios;
STEP 2. Barrier analysis;
STEP 3. Investment analysis (if applicable);
STEP 4. Common practice analysis.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulation

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[2] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v3.0.0.pdf

This step serves to identify all alternative scenarios to the proposed project scenario through the following sub-steps:

Sub-step 1a: Definition of alternative scenarios to the proposed project activity

Three alternatives to the JI project scenario have been identified:

- The activity could occur without being registered as a JI project activity through government or private sector support. In such a scenario the Ukrainian government or private sector sponsor would purchase CFLs and pay for their distribution at no or little cost to consumers. There are significant barriers to this alternative scenario. Most importantly, there is currently no budget allocated by the Ukrainian government for such an undertaking. In addition, there are no documented projects of the same scale in government project planning. Whilst in 2008 there was a guideline (#1337-p, 16/10/2008) by the Cabinet of Ministers promoting energy efficient lighting devices in government buildings, there has not been any finances allocated in support of this guideline. Consequently, this document has not achieved any results.
- Individual or collaborative efforts by Ukrainian retailers to promote rapid uptake of energy efficient lighting technology by consumers in Ukraine. This scenario would entail consumers to responding to increased marketing or promotion of efficient lighting alternatives and purchasing CFLs. The capacity of Ukrainian consumers to purchase CFLs at retail prices is a significant barrier to this alternative. Based on national income data, for an average employed person, purchasing 5 CFLs (at a cost of US$5 per bulb) would require spending about 35% of his weekly earnings[3], which place relatively high strain on household budgets. On the other hand, recession squeezed budgets of government and commercial organisations allocate no or little capital for investment in energy efficiency. Consequently, the relatively high upfront cost of CFLs compared to incandescent lamps is a major barrier to consumer uptake.
- Continuation of the current situation is also a possible alternative scenario. The baseline alternatives include either continued use of existing lighting, or autonomous replacement of current lights with new technologies or measures of either the same of greater efficiency. Achieving the same outcome as the proposed project would entail large-scale autonomous uptake of CFLs by consumers. As discussed above, autonomous uptake of CFLs is hampered by their cost, and as such the most likely outcome of a continuation of the current situation would be the provision of light mainly through the use of less expensive incandescent lamps.

Sub-step 1b: Consistency with mandatory laws and regulations

Each of the potential alternatives to the project discussed above:
- the project occurring without being registered as a JI project through government or private sector support;
- individual or collaborative efforts by Ukrainian retailers to promote rapid uptake of energy efficient lighting technology;
- *status quo* i.e. continuation of the current situation with the predominant use of incandescent lamps

are consistent with Ukrainian laws and regulations. The proposed project activity is therefore not the only alternative amongst those considered that complies with mandatory regulations.

Step 2: Barrier analysis

This step serves to identify barriers and to assess which alternatives are prevented by these barriers. The following two sub-steps are applied.

Sub-step 2a: Identification barriers that would prevent the implementation of alternative scenarios

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[3] http://www.obzorzarplat.com.ua/average-wage-ukraine-2011/

Barriers to the uptake of energy efficient products, including CFLs, are well documented. Such barriers include inadequate access to capital, isolation from price signals, information asymmetry and split-incentives [4,5]. That such barriers exist is clear given that CFLs only account for 6% of the global lighting market despite their financial benefits and having been available for several decades[6]. The list of barriers that in our view may prevent alternative scenarios to occur is below.

High initial price of CFLs

Particularly relevant for low-income consumers is the fact that CFLs may be up to ten times more expensive than incandescent light bulbs. In the process of prioritising household expenditure towards basic requirements such as food, healthcare and education, there may be very little opportunity for spare capital to be targeted towards investments in energy efficiency. Despite the financial savings delivered by energy efficiency improvements, the upfront capital requirement acts as a significant barrier to their uptake. To address this barrier, the project activity involves the sale of the CFLs at the prices substantially lower than the costs i.e. generates net loss without ERU sales.

Lack of consumer information

In Ukraine, understanding of the benefits of energy efficiency remains rudimentary. Barriers to obtaining and applying information relating to energy efficiency are significant, including:

– Time lag between energy consumption and payment of energy bills. Energy price information is divorced from the time at which it is consumed. This time lag can impact the efficacy of price information in influencing consumer awareness and behaviour with regard to energy use.

– Aggregated energy prices may limit consumers' understanding of the individual appliance use and its impact on energy bills. Consumers are not aware of which particular appliance or equipment is contributing to the total price they ultimately pay for electricity for a given period, militating against behaviour change, demand response and investment in energy efficient technologies.

Doubts that promised savings will accrue

A significant part of the Ukrainian CFL market belongs to low cost and also low quality CFLs leading to large scale failure rates. The poor performance especially by early generation CFLs created certain consumer distrust in the CFL technology.

Sub-step 2b: Elimination alternative scenarios which are prevented by the identified barriers

The only plausible scenario that is not prevented by any of the above listed barriers is continuation of the current situation (*status quo*) and according to the "Combined tool to identify the baseline scenario and demonstrate additionality " version (03.0.0 by 15.04.2011) is identified as the baseline scenario.

Conclusion 1: The baseline scenario for JI project "Distribution of energy efficient light bulbs in public and private sectors of Ukraine" is continuation of the current situation.

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[4] Mind the Gap: Quantifying Principle-Agent Problems in Energy Efficiency, International Energy Agency, 2007, Paris, France.

[5] KfW-Survey of the barriers and the profits of energy efficiency measures, KfW Bankengruppe, 2005

[6] Barriers to Technology Diffusion: The Case of Compact Fluorescent Lamps, Information paper for the Annex 1, Expert Group on the UNFCCC, OECD/IEA, 2006, Paris, France.

Each of the barriers discussed above can be overcome by registering the proposed project as a JI activity. Financial barriers such as access to capital and discount rates are overcome due to the fact that the carbon finance delivered by the project enables CFLs to be provided with strong financial incentives i.e. discounts and compensations. Similarly, information barriers and high transaction costs will be ameliorated through the media and promotional activities which will direct consumers to distribution centres with clear instructions and information regarding CFL benefits.

Step 3: Investment analysis

As there is only one scenario that is not prevented by any barrier, investment analysis is not mandatory. Nevertheless, the analysis is included as one of the addenda (Addendum 2) to this PDD.

Step 4: Common practice analysis

Currently activities similar to the proposed project are not observed in Ukraine, therefore, according to the tool, the proposed JI project is additional.

Conclusion 2: JI project "Distribution of energy efficient light bulbs in public and private sectors of Ukraine" provide a reduction in emissions that is additional to any that would otherwise occur.

B.3. Description of how the definition of the project boundary is applied to the project:

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The project boundary is defined by the geographical location of each energy efficient light installed by consumers involved in the project.

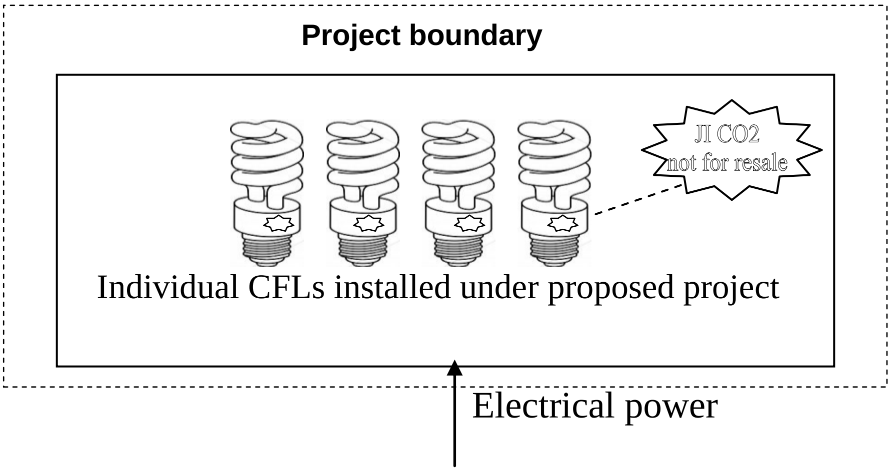

Figure 4: The project boundary

The GHGs included in the project boundary are summarised in the following table.

Table 6: Summary of gases and sources included in the project boundary and justification / explanation where gases and sources are not included

	Source	Gas	Included?	Justification / Explanation
Baseline	Power plants servicing the electricity grid	CO_2	Yes	Major source
		CH_4	No	Minor source.
		N_2O	No	Minor source.
	Power plants	CO_2	Yes	Major source

	servicing the electricity grid	CH_4	No	Minor source.
		N_2O	No	Minor source.

If electricity demand drops, the first power plants that reduce production are the fossil fuels burning plants. By burning fossil fuels, power plants emit CO_2 as the main product of combustion process. Other GHGs are only emitted in relatively small quantities or not emitted at all. Advocating conservative approach, the project team is not taking into consideration reductions of the GHGs other from CO_2. Additionally, according to the guideline of the State Environmental Investment Agency of Ukraine, other sources apart from CO_2 are not considered and emission factors for them are not presented[7].

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

>>
Date of baseline setting: 09/12/2010
Name of person/entity setting the baseline:
Dr. A. Alexandrov
Head Analyst
Primlight, LLC
Shkilna Street
25-A, #10-A
Petropavlivska Borschagivka
Kiev region 08130
Ukraine

Phone: 38-068-5302037
a_alexandrov2001@yahoo.co.uk

PRIMLIGHT LLC is the project participant.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

>>
the 26th of November, 2007. The project starting date - 26.11.2007 based on the Protocol of Intent #26/1 of 26.11.2007.

C.2. Expected operational lifetime of the project:

>>
24 years. Following the project model by 2021, incandescent lamps will be phased out (conservative approximation)[8]. That makes 14 years. This period is reserved for both distribution and monitoring. Additional 10 years are reserved for monitoring only to follow emission reductions generated by distributed CFLs. By 2031, all distributed CFLs will burn out.

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[7] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

[8] http://www.marketing-ua.com/articles.php?articleId=2159

C.3. Length of the crediting period:

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The start of the crediting period is 01/01/2008.
The length of the crediting period is 24 years or 288 months.

The total crediting period is divided in two periods (the first commitment and post-Kyoto period):

1. 01/01/2008-31/12/2012
   The length of the first commitment period is 5 years

2. 01/01/2013-31/01/2031
   The length of the post-Kyoto period is 19 years.

The end of the crediting period is:
the first commitment -31/12/2012
post-Kyoto period - 31/12/2031.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

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The key points of monitoring plan are listed below.

Collection of CFL Nameplate Data

The project coordinator will keep a record of the power rating of the CFLs distributed during the project activity and use this to determine the weighted average power rating for the project devices. CFLs distributed under the JI project will be marked with a logo 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 will be undertaken by installing metering equipment to consumers belonging to the Project Sample Group (PSG). PSG size will be no less than 100 participants (as in AM0046 version 2) with no more than 10 CFLs to be monitored at each participant. If the number of CFLs installed with a specific PSG participant exceeds the number of CFLs intended for monitoring, then randomly selected CFLs will be monitored with that PSG participant.

The annual operating hours of monitored devices will be used to determine the energy baseline as per equations listed in D.1.2.2. below. The average hours of use of light bulbs found in the PSG will be 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 will be 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 will be used in the calculations of emission reductions as stipulated in the equations provided in section D.1.2.2. below.

Establishment of Project Sample Group

The procedure to determine the sample of CFLs will ensure that they adequately represent the broader population, minimising 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 will be to a degree, self-selected rather than purely random. Despite these limitations, the project coordinator will work hard to ensure that devices sampled are representative of the broader population of measures in participating consumers.

As discussed above, the results obtained from the sampling process will be 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 will be taken to be representative of the pattern occurring to all consumers. For example, if the check at the end of a monitoring period reveals that 93% of the bulbs originally distributed to the sample group are still functioning, it will be extrapolated that 93% of *all* CFLs distributed under the project activity are still functioning.

Project Database

The project owner will develop and manage a project database that will record 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:
  - Identification number for each piece of equipment
  - Type of monitoring equipment and date of installation
  - Confirmation at each check that monitoring equipment is functioning
  - Confirmation at each check that the monitored CFL is functioning
  - Utilization data (hours of use and/or electricity consumption)

The block diagram of the project database is presented in figure 5. Examples of individual information sheets related to distribution and sampling are presented in annex 5.

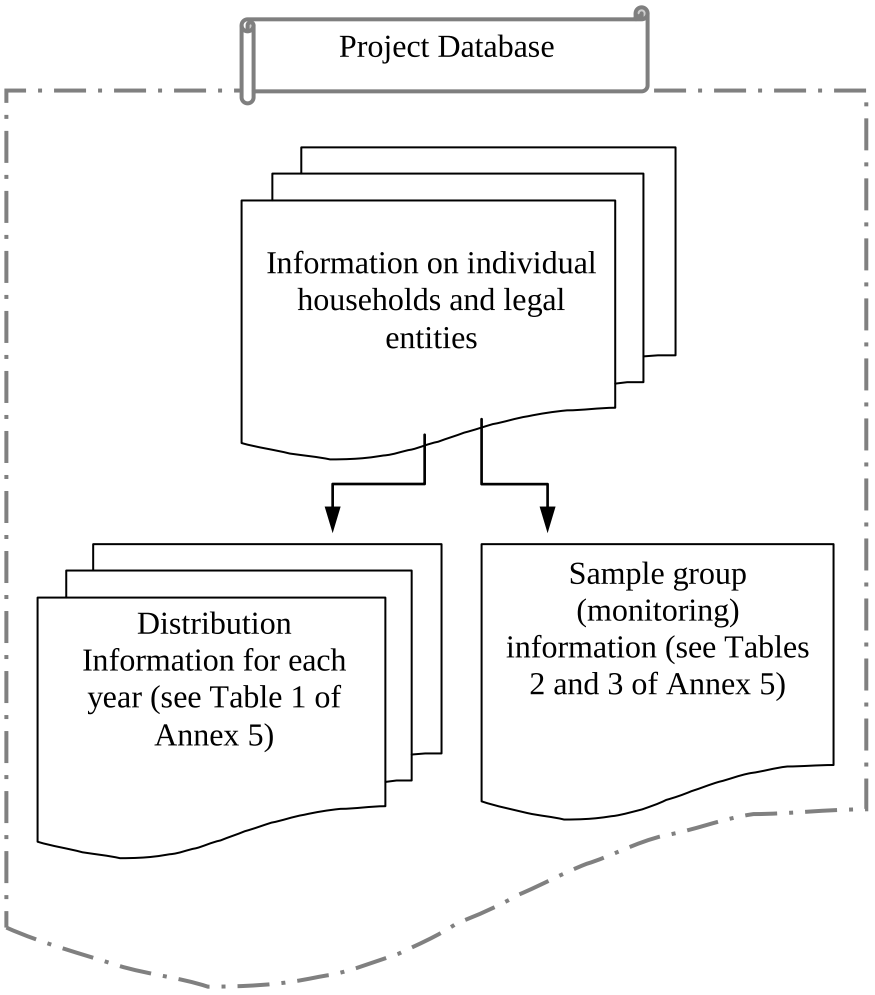

Figure 5: Block diagram of the project database

The time of use t_y^{on} will be collected from metered lamps of PSG. The proportion of the lamps still operating at the end of each monitoring period $Q_{j,y}$ will be equivalent to the proportion of the lamps functioning without failure in PSG.

Monitoring Periods

Data will be collected for every monitoring period, and used to calculate emission reductions for that portion of the crediting period. The anticipated standard length of each monitoring period is one year. In any case the length of the monitoring period will not exceed five years. It is assumed that installation will occur on the day of distribution. The project coordinator is able to accurately determine the number of bulbs distributed on a daily basis as each transaction is logged with a time and date. This data will be used to determine the cumulative number of bulbs installed and the energy savings attributable to any distribution period.

CFL Collection & Recycling Scheme

The project owner is committed to the safe collection, scrapping and recycling of CFLs and will work with key institutions in Ukraine to establish such a scheme. The project owner will report to the verifying AIE on the establishment of CFL collection and recycling programs. At the moment, the following recycling procedure is set. CFLs that failed during warranty period are exchanged free of charge and sent to recycling. Retuned end-of- life lamps and lamp batches that does not meet technical standards are also sent to recycling. The recycling process is based on de-mercurisation of the collected CFLs. The process is conducted according to the internal technical documentation and consists of vacuum distillation of mercury vapour and accumulating condensed metal in a safe container. Full description of recycling technology is presented in Addendum 4.

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

This section is left blank on purpose.

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

This section is left blank on purpose.

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

This section is left blank on purpose.

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
01	*S* Total number of CFLs distributed	Direct counting	pieces	m	Real time continuous recording	100%	Electronic	

02	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	
03	Q The number of operational CFLs	Checks of the sample group	pieces	m	Monitored continuously with annual recording and aggregation	Project sample group	Electronic and paper	
04	k Wattage difference between CFL and corresponding incandescent lamps	Direct counting	Watts	m/e	Real time continuous recording	100%	Electronic and paper	
05	$EF_{CO2,ELEC}$ 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 repot development

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

>>

Total emission reduction for monitoring period *y* is calculated as follows:

$$ER_y = EB_y - EP_y = NES_y \cdot EF_{CO2,ELEC,y} \qquad (1)$$

Where

EP_y - total project emissions during period *y*, (*tons CO_2- eqv.*),

EB_y - total baseline emissions during period *y*, (*tons CO_2- eqv.*),

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

$EF_{CO2,ELEC,y}$ - emission factor (*tons of CO_2 equivalent /megawatt* hours*).

The net electricity saving for period *y* is calculated as

$$NES_y = \sum_{j=1}^{m} Q_{j,y} \cdot k_j \cdot t_y^{on} / 1{,}000{,}000 \qquad (2)$$

Where

m number of types of CFLs,

k_j wattage difference between CFL and corresponding incandescent lamp (as per conversion table 2) 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*.

D.1.3. Treatment of leakage in the monitoring plan:

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Section D.1.3.1 information is n ot applicable (please see D.1.3.2.)

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

Leakage is not expected for this project. The project does not result in a leakage or the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

>>

The emission reductions from the project are estimated by multiplying together the net electricity savings and emission factor (please see section D.1.2.2)

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

>>

N/A

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
01 (table D.1.2.1.)	low	QA/QC procedures are not necessary
02 (table D.1.2.1.)	low	QA/QC procedures are not necessary
03 (table D.1.2.1.)	low	QA/QC procedures are not necessary

The project owner have adopted quality control management system (QCMS) that has been successfully certified on compliance to international standards ISO 9001:2000, ISO 9001:2008 and national standards DSTU 9001-2001. Full description of quality control and quality assurance procedures is attached as Addendum 3.

D.3. Please describe the operational and management structure that the project operator 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;
- Setting internal auditing procedures for data verification consistent with JI requirements;
- Database system administration;
- Calculation and reporting of ERUs generated by the project activities.
-

The detailed description of auditing procedures is given in Addendum 3 and involves audit of each process or department at least once a year. Audits of the units inconsistent with quality assurance requirements may be conducted more frequently.

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 7: 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 to Households	− Management of distribution points; stock; customer transactions and staff − Household data collection

Distribution to Legal Entities	− 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.

Table 8: Personnel responsible only for monitoring

Responsibility	Staff
General guidance	Vice- CEO
Selection & recruitment of sample groups	Sales manager
Periodic collection of monitoring data	Sales manager
Preparation of monitoring reports for emission reduction verification	Head Analyst

The project database will include the following data-set that can be directly attributable to each project participants.

- A list of participants including:
  1. name of person or organisation,
  2. address,
  3. identification number, type and wattage of light bulbs distributed,
  4. date of the distribution.
- Metering data collected from the Project Sample Group (PSG) relating to the on-going usage of project CFLs during each monitoring period;
- Data obtained from project PSG indicating the proportion of project CFLs operating during each monitoring period.

A monitoring report will be produced for the AIE to verify data corresponding to the preceding monitoring period. This report will unambiguously set-out the data relating to the emission reductions during the monitoring period. The project sample group will be unambiguously identified, and its data will be used for the calculation of emission reductions.

Verification of the project will occur at the end of each monitoring period. The project database will record the start and end dates of each monitoring period, and record the emission reductions attributable to each monitoring period. An audit of the project database will be able to determine the current status of the project – the duration of previous monitoring periods, the sample groups delivering monitoring data, and current verification activities.

The data will be kept for no less than two years after the last ERU transaction.

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

>>

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PRIMLIGHT LLC is the project participant.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

>>

The project involves direct estimation of emission reductions (option 2, section D.1.2.), rather than project and baseline emissions.

E.2. Estimated leakage:

>>

Leakage is not expected for this project. The proposed project does not result in a leakage or the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary.

E.3. The sum of E.1. and E.2.:

>>

N/A

E.4. Estimated baseline emissions:

>>

The project involves direct estimation of emission reductions (option 2, section D.1.2.), rather than project and baseline emissions.

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

>>

The total GHG emission reduction of the project is 149 434 561 metric tonnes of CO_2 equivalent with average annual reductions of 6 226 440 tonnes over 24 years. The estimated annual reductions presented in section A.4.3.1 and in the graph below.

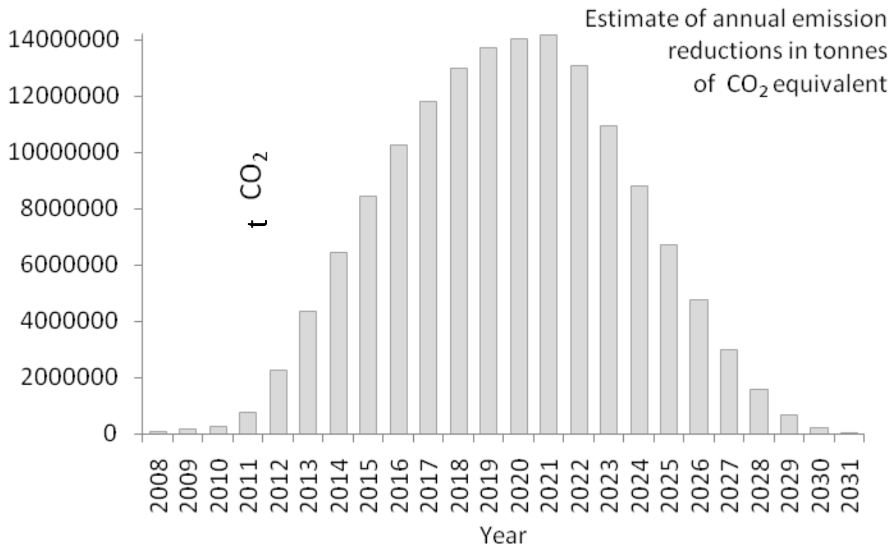

Figure 6: Estimate of annual emission reductions

E.6. Table providing values obtained when applying formulae above:

>>

From 2008 to 2012

Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	57 689
2009	178 997
2010	275 432
2011	741 088
2012	2 239 432
Total estimated emission reductions (tonnes of CO2 equivalent)	3 492 638

After 2012

Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	4 364 925
2014	6 442 554
2015	8 435 318
2016	10 265 311
2017	11 817 463
2018	12 981 745
2019	13 711 463
2020	14 045 138
2021	14 156 352
2022	13 092 580
2023	10 939 195
2024	8 807 344
2025	6 718 561
2026	4 737 447
2027	2 971 671
2028	1 593 504
2029	646 015
2030	193 804
2031	21 533
Total estimated emission reductions (tonnes of CO2 equivalent)	145 941 923

For the total crediting period (01/01/2008 to 31/01/2031):

- Total estimated emission reductions – 149 434 561 (tonnes of CO2 equivalent).
- Annual average of estimated emission reductions -6 226 440 (tonnes of CO2 equivalent).

Assumptions and parameters used for the calculations of the above table and graph are presented in annex4.

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

>>

CFLs contain a very small amount of mercury sealed within the glass tubing – 5 milligrams on average (roughly equivalent to the tip of a ball-point pen). By comparison, older thermometers contain about 500 milligrams of mercury – an amount equal to the mercury in 125 CFLs. Mercury is an essential, irreplaceable element of CFLs as it allows the bulb to be an efficient light source. There is no current substitute for mercury in CFLs; however, manufacturers have taken significant steps to reduce mercury levels in fluorescent lighting products over the past decade, with some beginning research into the production of mercury-free CFLs.

Most mercury vapour inside fluorescent light bulbs becomes bound to the inside of the light bulb as it is used. It is estimated that the rest of the mercury within a CFL – about 14 per cent (0.7mg) – is released into air or water assuming the light bulb is broken.

Although CFLs contain mercury, paradoxically their use results in less mercury in the environment compared to traditional light bulbs. This is due to the fact that one tone of coal used in Ukraine contains on average 0.42 grams of mercury[9]. During coal burning process this mercury is entirely emitted as vapour. This is confirmed by experiments, as well as theoretical calculations[10,11]. As shown in the table below, a 13-watt, 10,000-rated-hour-life CFL (60-watt equivalent) will save 470 kWh over its lifetime, thus avoiding 78 mg of mercury if properly recycled. If the bulb goes to a landfill, overall mercury emission savings would drop a little, to 77.3 mg.

Table 8: Mercury emissions from a 13 Watt CFL and corresponding incandescent lamp

Light bulb type	Watts	Hours of use	kWh use	Tons of coal*	Mercury from electricity** (mg)	Mercury from landfilling (mg)	Total mercury (mg)
CFL	13	10,000	130	0.065	22	0.7	22.7
Incandescent	60	10,000	600	0.3	100	0	100

*Conservatively assuming that 1 ton of coal generating 2 MWatt-hour of electricity.

**For coal-fired power plants with 20% capture at filters.

The above table shows that despite the fact that CFLs contain small amount of mercury, it is way less than would be emitted by a coal-fired power plant to light incandescent bulbs for the same amount of time.

---

[9] B. S. Panov *et al*, Eco-technological problems of coal extraction, enrichment and utilization, Donetsk National Technical University, 2003.

[10] M. Ya. Shpirt, Migration of mercury and its compounds in coal processing. Solid Fuel Chemistry, 2002, #5, pp. 73-86.

[11] Sources of mercury emission in Russia, Review by Zero Mercury, 2010.

The end-of-life CFLs will be collected by the project team, and then they will be disposed via an appropriate recycling process in cooperation with a registered recycling company operating within applicable environmental norms. The current recycling scheme is described in Addendum 4.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

As stated above, the project will involve the distribution of energy efficient light bulbs already available to consumers. These items have passed relevant quality standards and their use does not entail significant environmental impacts. The Ukrainian Government does not require that environmental impact assessments be undertaken for activities included in the project.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

>>

No stakeholder consultation process for the JI projects is required by the host party. Stakeholder comments will be collected during the time of this PDD publication on the internet during the determination procedure.

Current stakeholder comments collected during determination process are presented in Addendum 1.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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Annex 2

BASELINE INFORMATION

By various estimates, Ukraine's lighting stock consists of 200-250 millions electrical lamps. The brakedown of the lamps by types is presented in table 9 (below).

Table 9: Brakedown of lamps by their types

Type	Percentage
Incandescent	80%
CFLs	10%
High Pressure Discharge	2%
Others (non compact fluorescent, light emitting diodes, etc.)	8%

The sales of incandescent lamps dropped a little in 2007 and 2008, accelerated in 2009 and remained steady in 2010[12]. This situation can be most adequately described as stagnant.

The sales of CFLs have been increasing slowly but steadily. However, taking into account stagnant incandescent sales, the CFL's increase can be attributed mainly to newly built residential and office facilities. In other words, new fixtures are usually lamped with CFLs.

The baseline situation was analyzed in 2007 and revised in 2009. However, as this situation has not been changing from year to year, any year can be considered as the base year. In any case, as the base year, 2007 is considered (the year preceding the initial stage of the project).

Summarizing all the above, the baseline scenario of the proposed project is assumed to be a continuation of current practice which involves purchase and use of incandescent lamps on a large scale, and related GHG emissions that would have occurred in case the project would not be implemented and the replacement of general lighting bulbs by CFLs would not take place. The baseline therefore is the predominant use of standard incandescent lamps with wattages in a range from 25 to 500 watts.

[12] http://pau.com.ua/news/4/13734/

Annex 3

MONITORING PLAN

The key elements of monitoring plan are listed below.

The project owner will keep a record of the power rating of the CFLs distributed during the project activity and use this to determine the weighted average power rating for the project devices. CFLs distributed under the JI project will be marked with a logo to ensure that they can be unambiguously differentiated from other light bulbs.

Monitoring a sample of distributed CFLs to determine average hours of utilization will be undertaken by installing metering equipment to consumers belonging to the Project Sample Group (PSG). PSG is selected randomly similar to (AM0046 version 2) by means of random number generator. If a different from random type of sampling (i.e. systematic, stratified, quota, cluster) is used, this will be reflected in the corresponding monitoring report. PSG size will be no less than 100 participants (as per AM0046 version 2) with no more than 10 CFLs to be monitored at each participant. If the number of CFLs installed with a specific PSG participant exceeds the number of CFLs intended for monitoring, then randomly selected CFLs will be monitored with that PSG participant. The current metering equipment along with its technical characteristics has been disclosed to the AIE. The measuring devices are installed at each fixture. They measure and then store in internal memory all the relevant information including hours of utilization of the CFL. The content of memory is accessible via USB port. For each monitoring period a mean value will be obtained for the hours of utilization from PSG, then statistically corrected to a confidence level of 95% (similar to AM0046 version 2), and extrapolated across the total number of CFLs operating during that monitoring period. This will be entered in the calculations of emission reductions as stipulated in the equations provided in section D.1.2.2.

The project owner will develop and manage a project database that will record 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:
  - Identification number for each piece of equipment
  - Type of monitoring equipment and date of installation
  - Confirmation at each check that monitoring equipment is functioning
  - Confirmation at each check that the monitored CFL is functioning
  - Utilization data (hours of utilization and/or electricity consumption)

Data will be collected for every monitoring period, and used to calculate emission reductions for that portion of the crediting period. The anticipated standard length of each monitoring period is one year. In any case the length of the monitoring period will not exceed five years. It is assumed that installation will occur on the day of distribution. The project owner is able to accurately determine the number of bulbs distributed on a daily basis as each transaction is logged into the database with a time and date. This data will be used to determine the cumulative number of bulbs installed and the energy savings attributable to any distribution period.

Annex 4

Assumptions and parameters used for the estimation of emission reductions

For *ex ante* calculations of GHG emission reductions, the following assumptions have been made:

- The average time of use of artificial lighting by consumers is equal to 1350 hours per year.

  The above number is based on our preliminary study of artificial lighting usage in various building types.

- Comparing to an incandescent lamp, average electricity saving by CFL is 65 watts per hour.

  The above number is based on the average incandescent lamp power of 84 Watts (please see section B.1.) and corresponding CFL of 19 Watts.

- The life span of a CFL is 10 000 hours.

  This is the most frequent life span of CFLs and it is considered as standard by most manufacturers.

- CFL failure is distributed normally (Gaussian distribution).

  The distribution of lamp failure is presented in the following table.

Table 10: Number of failures for different CFL types

Lifespan (hours)	% of failures within hour intervals										Total (%)
	0-3000	3000-6000	6000-9000	9000-12000	12000-15000	15000-18000	18000-21000	21000-24000	24000-27000	27000-30000	
6000	3	47	47	3	X	X	X	X	X	X	100
10000	0	6	30	43	19	2	0	X	X	X	100
15000	0	1	5	15	29	29	15	5	1	X	100

- Numbers of distributed CFLs are as follows

  2 926 791 CFLs (total) from 01/01/2008 till 01/01/2011;
  8 000 000 CFLs during 2011;
  20 000 000 CFLs (per year) from 01/01/2012 till 31/12/2021;
  0 CFLs from 01/01/2022 till 31/12/2031.

The results of calculations are presented in the following graphs:

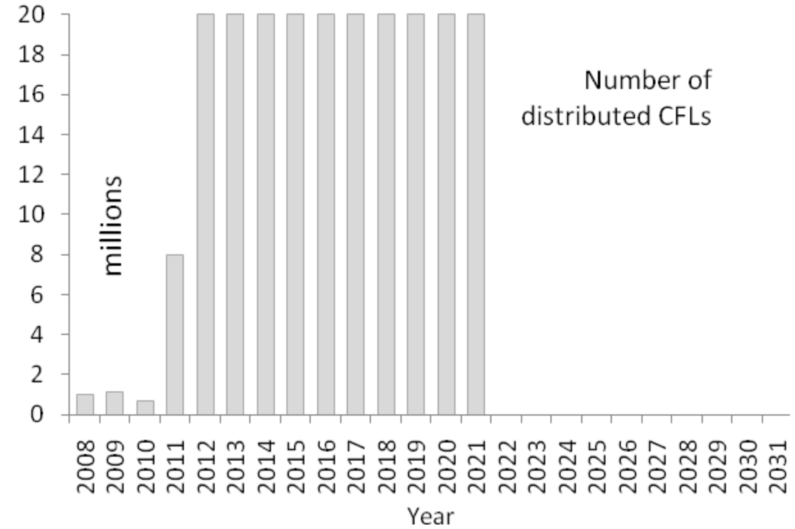

Figure 7: Estimate of annual CFL distributions

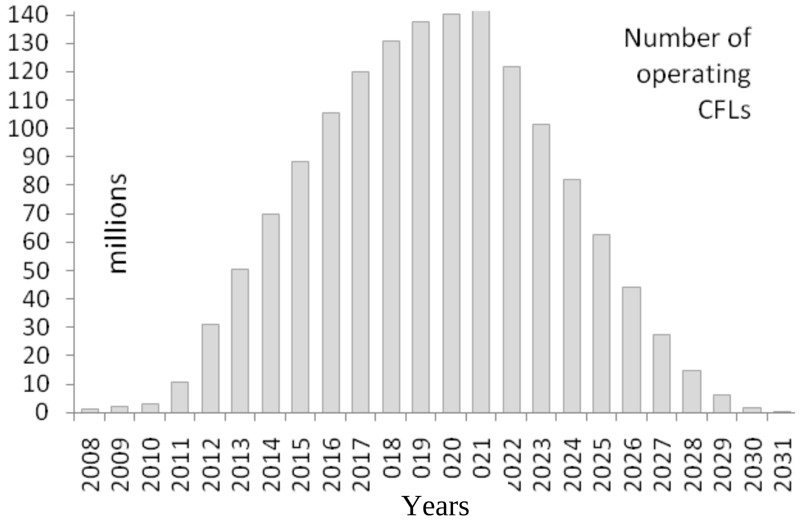

Figure 8: Estimate of CFLs operating within the project

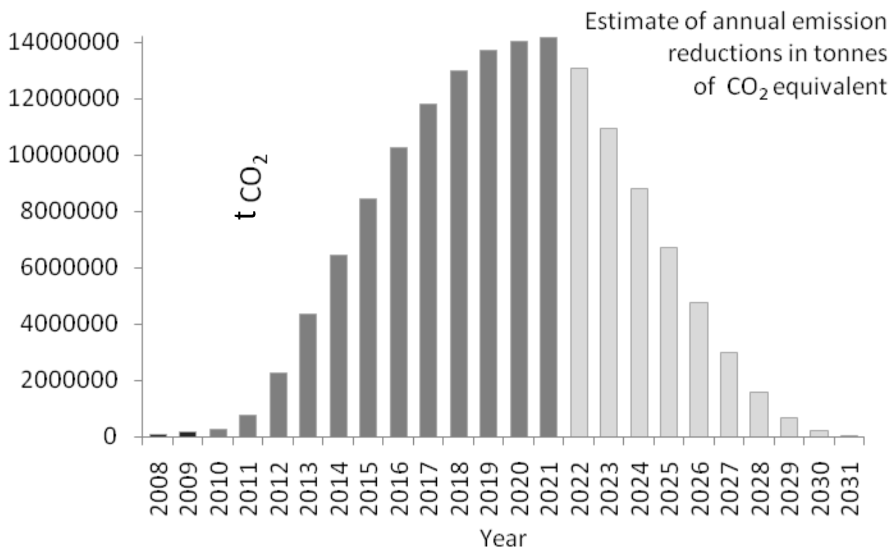

Figure 9: Estimate of annual emission reductions within three periods of the project

Annex 5

Examples of information sheets of CFL distribution

Table 11: An example of the information sheet of CFL distribution (households)

Distribution of energy efficient lamps to Ukrainian households 2020																							
Personal number	Name	Address	Lamps distributed																		Retuned for utilization		Additional info
			Date/ time	Serial #	Type 1			Type 2							Type 3						Date	Serial #	
					Wattages			Wattages							Wattages								
					15	18	20	7	9	11	13	15	20	23	5	9	11	13	16	23			
001	Petrenko Petro	Vokzalna street 2/5 Apt.9, Rivne	20.05 14:10	876990 765755 768999 567777		1			1			1							1				
002	Ivanov Ivan	Pushkin street 18, Kiev	12.06 11:00	340966 380999 370888										1					1	1	12.06	12345	
003	Joe Bloggs	Irpen	12.06	433369							1												

Table 12: An example of the information sheet of a sampling group (households)

Sample group for households Distribution of energy efficient lamps to Ukrainian households 2020														
ID	Name	Address	Phone	Metering devices installed					Lamps installed					Additional info
				ID	Type	Date	Readings		Plate #	Type	wattage	date		
							Current	Previous				installed	replaced	
01	Sidorchuk Sidor	Leo Tolstoy street 8, Kiev	222-18-12	0123	2	12/03	8,645	7,649	345670	3	23	01/01/2012	-	
				0124	2		7,920	7,004	345675	3	23	01/01/2012	-	
				0125	2		8,200	7,012	345679	3	16	01/01/2012	-	
				0126	2		2,123	1,196	845670	2	20	01/01/2012	08/06/2018	
02	Petrova Lisa	S.Perovskaya Street 12 Kiev	555-99-88	0162	1	12/09	8,685	7,641	445670	2	23	05/01/2012	-	
				0164	1		7,920	6,004	445675	2	20	05/01/2012	-	
				0165	1		7,200	6,012	445679	2	16	05/01/2012	-	
				0168	1		6,123	5,196	545670	2	20	05/01/2012	-	
				0169	1		8,200	7,920	495675	2	13	05/01/2012	-	
				0170	1		8,330	7,420	545679	2	20	05/01/2012	-	

Table 13: An example of the information sheet of a sampling group (legal entities)

Sample group for legal entities Distribution of energy efficient lamps to legal entities 2015														
ID	Name	Address	Represented by (name, phone)	Metering devices installed					Lamps installed					Additional info
				ID	Type	Date	Readings		Plate #	Type	wattage	date		
							Current	Previous				installed	replaced	

01	Hotel “Tourist”	Levoberejnaya square 2, Kiev	Sidorenko Mykola 222-18-12	0173	2	15/03	8,645	7,649	345670	3	23	01/01/2012	-	
				0174	2		7,920	7,004	345675	3	23	01/01/2012	-	
				0185	2		8,200	7,012	345679	3	16	01/01/2012	-	
				0186	2		2,123	1,196	845670	2	20	01/01/2012	08/06/2012	
				0163	1		8,685	7,641	445670	2	23	05/01/2012	-	
				0174	1		7,920	6,004	445675	2	20	05/01/2012	-	
				0175	1		7,200	6,012	445679	2	16	05/01/2012	-	
				0178	1		6,123	5,196	545670	2	20	05/01/2012	-	
				0179	1		8,200	7,920	495675	2	13	05/01/2012	-	
				0180	1		8,330	7,420	545679	2	20	05/01/2012	-	
02	Index Bank	Leo Tolstoy square 2, Kiev	Shevchenko Maria 222-18-45	0183	2	12/03	8,645	11,649	395670	3	23	01/01/2012	-	
				0184	2		7,920	11,004	395675	3	23	01/01/2012	-	
				0155	2		8,200	11,012	395679	3	16	01/01/2012	-	
				0156	2		2,123	9,196	895670	2	20	01/01/2012	09/06/2014	
				0187	2		6,768	7,772	395379	1	20	01/01/2012		