INITIAL AND FIRST PERIODIC JI MONITORING REPORT

Implementation of energy-efficient lighting system in the Donetsk Region with the use of Kyoto Protocol mechanism: replacement of incandescent lamps with energy-efficient ones at budget financed and social entities in the Torez town (under Track 2)

INITIAL AND FIRST PERIODIC JI MONITORING REPORT

Monitoring Period

07/02/2011 – 31/08/2012

CONTENTS

Annexes

SECTION A. General small-scale project activity and monitoring information

A.1 Title of the small-scale project activity:

Implementation of energy-efficient lighting system in the Donetsk Region with the use of Kyoto Protocol mechanism: replacement of incandescent lamps with energy-efficient ones at budget financed and social entities in the Torez town (under Track 2)

Sectoral scope 3: Energy demand

Type: Small-scale

Version 03
07/02/2013

A.2. Information about registration and approval of the small-scale project:

UNFCCC JI reference number **0287.**
ITL project ID **UA2000045.**

Letter of approval was obtained from the host Party (Ukraine) - Letter of Approval # 3150/23/6, issued by the State Environmental Investment Agency of Ukraine as of 28/10/2011.

Written project approval by a Party involved in JI small-scale project, other than the host Party was obtained – Declaration of Approval reference #2011JI58 on 02/02/2012, issued by "NL Agency" Ministry of Economic Affairs, Agriculture and Innovations.

A.3. Short description of the small-scale project activity:

The project supports the replacement of 100 W and 150 W incandescent lamps (ICLs) with 20 W and 32 W Compact Fluorescent Lamps (CFLs) which are energy saving lamps compared to ICLs, since they consume four-five times less power with similar lighting. CFLs are to be installed instead of the 100 W and 150 W ICLs and will provide the minimum light flux of 1,350 Lm and 2,180 Lm respectively. The service life of CFLs proposed for installation under the project reaches 8000 hours, which is 8 times higher than the service life of typical ICLs. CFLs are fully compatible with standard ICL holders (sockets) and provide "eye-safe" white soft lighting. The project covers the replacement of only the 100 W and 150 W ICLs with 20 W and 32 W CFLs.

Under the project activity it was replaced 11 048 pieces traditional ICLs (8 079 pieces of 100 W; 2 969 pieces of 150 W) with up-to-date CFLs in schools, kindergartens, hospitals, health centres and others facilities of Town Council. Breakdown of CFLs installed under the project activity separately for each type of facilities was confirmed by project coordinator Innovation Center "Ecosystem" (please see "Installed CFLs in each type of facilities" - supporting document (SD) - 1) and indicated in tables A.1., A.3., and B.2. of this Report.

Results of emission reductions calculation for monitoring period 07/02/2011 – 31/08/2012 is 4 561 tonnes of CO_2 equivalent.

A.4. Monitoring period:

Starting date of monitoring period: 07/02/2011 at 00:00.
Closing date of monitoring period: 31/08/2012 at 24:00.

A.5. Methodology applied to the project activity (incl. version number):

Monitoring plan of the GHG emissions in the project and baseline scenarios and the GHG emission reductions is elaborated on the basis of requirements of the "Guidance on criteria for baseline setting and monitoring", (version 03)[1].

The monitoring plan is based on project-specific JI approach and partly on methodology AMS II.J – "Demand-side activities for efficient lighting technologies" (version 04)[2] .

A.5.1. Baseline methodology:

The baseline chosen is provided in accordance with "Guidance on criteria for baseline setting and monitoring", (version 03)[3] and in accordance with "Guidelines for users of the joint implementation project PDD form for small-scale projects and the form for submission of bundled joint implementation small-scale projects " (version 04)[4].

The JI specific approach with elements of methodology AMS-II.J - "Demand-side activities for efficient lighting technologies" (version 04)[5] was used for setting of the baseline.

A.5.2. Monitoring methodology:

The chosen monitoring approach includes monitoring and estimation of baseline emissions, project scenario emissions and leakages. The GHG emissions are estimated as follows:

Stage1. Baseline emission calculation

Step1. The electricity consumption in baseline scenario in year 'y' is calculated as follows:

$$EC_{BL,y} = \sum_{i,j,k,l=1}^{n} Q_{BL,ijkl} \cdot P_{i,BL} \cdot OD_{ijkl} \cdot d_{ijkl} / 1000 \qquad \text{(A.1)}$$

Table A.1. Description for baseline electricity consumption calculation

Symbol	Parameter Definition	Monitoring value
$EC_{BL,y}$	Baseline electricity consumption in year y (kWh)	Calculated based on Equation (A.1)
$\sum_{i,j,k,l=1}^{n}$	Sum over : - the group of "i" devices (i.e. 100 W and 150 W ICLs); - the type of day (workday or non-workday) - "j"; - the season (winter, spring, summer and autumn) - "k"; - the type of building (school, kindergarten, medicine)- "l".	-
$Q_{BL,ijkl}$	Number (quantity) of devices of the group of "i" devices (i.e. 100 W and 150 W ICLs)	100 W: Schools: 2 718 Kindergartens: 2 281 Medicine: 2 135

[1] Source: http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf

[2] http://cdm.unfccc.int/methodologies/DB/5RMYBVTQ83H9CJA99M2392TSNO9IUJ

[3] Source: http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf

[4] http://ji.unfccc.int/Ref/Documents/Guidlines_users_JISC_PDD_Form.pdf

[5] http://cdm.unfccc.int/methodologies/DB/5RMYBVTQ83H9CJA99M2392TSNO9IUJ

		Other: 945 150 W: Schools: 1 170 Kindergartens: 950 Medicine: 0 Other: 849
$P_{i, BL}$	Power of the devices of the group of "i" baseline devices	100 W and 150 W
OD_{ijkl}	Average daily operating hours of the devices of the group of **"i"** baseline devices (100 W and 150 W) during workdays (**j=1**) and non-workdays (**j=2**). The average daily operational hours were estimated for different **seasons (k)** (due to changes in illumination needs). Winter (k=1), Spring (k=2), Summer (k=3) and Autumn (k=4). February average daily hours were used for winter; April hours for Spring and July hours for Summer seasons. The average daily operational hours were also estimated for **type of buildings (l)** where the lamp is installed (School, Kindergarten or Medicine).	See section B.2.2.
d_{ijkl}	Number of days of monitoring period group of devices; for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l.	For Schools, Kindergartens and Others: February 2011 – August 2012: 399 workdays, 173 non-workdays; For Medicine: February 2011 – August 2012: 491 workdays, 81 non-workdays. Medicine facilities in Torez Town work 6 days a week. Their work schedules don't depend on holidays. Schools, Kindergartens and Others have 5 work days per week. Also, these facilities don't work on public holidays in Ukraine including December 31 – New Year; January 7 Christmas; March 8 - International Women's Day; April 24 in 2011 and April 15 in 2012 - Orthodox Easter; May 1 & 2 - Labour Days; and May 9 - Victory Day; June 12 in 2011 and June 3 in 2012 - Holy Trinity Day (Triytsya) ; June 28 - Constitution Day; August 24 - Independence Day.

Step 2. The emission in baseline scenario in year 'y' is calculated as follows:

$$BE_y = EC_{BL,y} \cdot (1 - F_{CFL,y}) \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad \text{(A.2)}$$

Table A.2. Description for baseline emission calculation

Symbol	Parameter Definition	Monitoring value
BE_y	Emission in year, tCO_2	Calculated based on Equation (A.2)
$EC_{BL,y}$	Electricity consumption in year y, kWh	Calculated based on Equation (A.1)
$F_{CFL,y}$	Fraction of CFLs in local public buildings within budget funding, fraction	0[6]
$EF_{CO2,ELEC,y}$	Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh	1.227[7].

Stage2. Project emission calculation

Step1. The electricity consumption by the project activity in year 'y' is calculated as follows:

$$EC_{PJ,y} = \sum_{i,j,k,l=1}^{n} Q_{PJ,ijkl} \cdot P_{i,PJ} \cdot OD_{ijkl} \cdot d_{ijkl} / 1000 \quad \text{(A.3)}$$

Table A.3. Description for project electricity consumption calculation

Symbol	Parameter Definition	Monitoring value
$EC_{PJ,y}$	Project electricity consumption in year y (kWh)	Calculated based on Equation (A.3)
$\sum_{i,j,k,l=1}^{n}$	Sum over: - the group of "i" devices (i.e. 20 W and 32 W CFLs); - the type of day (workday or non-workday) - "j"; - the season (winter, spring, summer and autumn) - "k"; - the type of building (school, kindergarten, medicine) – "l".	-
$Q_{PJ,ijkl}$	Number (quantity) of devices of the group of "i" devices (i.e. 20 W and 32 W CFLs)	100 W: Schools: 2 718 Kindergartens: 2 281 Medicine: 2 135 Other: 945 150 W: Schools: 1 170 Kindergartens: 950 Medicine: Other: 849
$P_{i,PJ}$	Power of the devices of the group of "i" project devices	20 W or 32 W
OD_{ijkl}	Average daily operating hours of the devices of the group	See section B.2.2.

[6] The value of fraction of CFLs in public buildings within budget funding (F_{CFL}) was determined according to the letter # 774-01/13/4-12 dated 18 May 2012 obtained from State Agency on Energy Efficiency and Energy Saving of Ukraine, as an executive body responsible for the formation and implementation of unified state policy on energy saving (SD-8).

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

	of **"i"** devices (20 W and 32 W) during workdays (**j=1**) and non-workdays (**j=2**). The average daily operational hours were estimated for different **seasons (k)** (due to changes in illumination needs). Winter (k=1), Spring (k=2), Summer (k=3) and Autumn (k=4). February average daily hours were used for winter; April hours for Spring and July hours for Summer seasons. The average daily operational hours were also estimated for **type of buildings (l)** where the lamp is installed (School, Kindergarten, Medicine or Other).	
d_{ijkl}	Number of days of monitoring period for group of devices; for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building (l).	For Schools, Kindergartens and Others: February 2011 – August 2012: 399 workdays, 173 non-workdays; For Medicine: February 2011 – August 2012: 491 workdays, 81 non-workdays. Medicine facilities in Torez Town work 6 days a week. Their work schedules don't depend on holidays. Schools, Kindergartens and Others have 5 work days per week. Also, these facilities don't work on public holidays in Ukraine including December 31 – New Year; January 7 Christmas; March 8 - International Women's Day; April 24 in 2011 and April 15 in 2012 - Orthodox Easter in 2011; May 1 & 2 - Labour Days; and May 9 - Victory Day; June 12 in 2011 and June 3 in 2012 - Holy Trinity Day (Triytsya) ; June 28 - Constitution Day; August 24 - Independence Day.

Step 2. The emission by the project activity in year 'y' is calculated as follows:

$$PE_y = EC_{PJ,y} \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad \text{(A.4)}$$

Table A.4. Description for project emission calculation

Symbol	Parameter Definition	Monitoring value
PE_y	Emission in year t CO_2	Calculated based on Equation (A.4)
$EC_{PJ,y}$	Electricity consumption in year y (kWh)	Calculated based on Equation (A.3)
$EF_{CO2,ELEC,y}$	Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh	1.227[8]

Stage 3. Leakages

There is no leakage in the project on either installation side or disposal side, due to the following reasons:

- Project leakage (indirect effects) may be incurred due to improper storage and partial re-use of ICLs that are replaced with CFLs. Leakage may occur, for example, either when undestroyed 100 W lamps are used instead of expired 60 W or 75 W ICLs in buildings outside of the project boundary or when such lamps are installed in locations with no illumination prior to project initiation. Implementing organizations properly replaced ICLs with CFLs, stored and disposed those ICLs being replaced.

- Replaced ICLs were collected from facilities and destroyed.

Possible other leakage:

- In the course of operation certain lamps fail which might result in decreased emission reductions. However, the project provides for the immediate replacement of failed CFLs with new CFLs. In the course of monitoring the replacement date is recording and the operating hours of the lamp are correcting as needed (e.g., during the replacement the time when the lamp is not functioning is subtracted from the daily number of operational hours).

- Unauthorized removal (theft) is possible for resale or personal use. But monitoring conditions for CFLs installed under the current project require a continuous supervision which effectively reduces the possibility of unauthorized removal. Also, the project stipulates immediate installation of new CFLs in case of detected unauthorized removal.

To ensure the immediate replacement of CFLs in case of their failure or unauthorized removal, a reserve of 1% working lamps is provided in each facility. According to the practice, this amount of reserve lamps is enough for immediate replacement/installation of working CFLs.

Stage 4. GHG emission reductions

GHG emission reductions in year 'y' (ER_y) are estimated by the following formula:

$$ER_y = (BE_y - PE_y) - LE_y \quad (A.5)$$

Where:
ER_y – Emission reductions in year y (tCO_2e)
BE_y – baseline GHG emissions in year 'y' (tCO_2e)
PE_y- project GHG emissions in year 'y' (tCO_2e)
LE_y – Leakage emissions in year y (tCO_2e)

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

A.6. Status of implementation including time table for major small-scale project parts:

As it was planned, the lamp replacement has started on 06 January 2011. The lamp replacement was finished at 04 February 2011. Therefore the project can be considered implemented.

Table A.5. Project Implementation

Activity	Actual date	Notes
Starting date of the lamp replacement	06/01/2011	Source: Transfer and acceptance act (SD-2)
Final date of the lamp replacement	04/02/2011	Source: Report of acceptance (SD-3)
Start date of monitoring CFL use hours	07/02/2011	Source: LogBooks

A.7. Threshold level of JI SSC project:

According to paragraph 12 of Provisions for JI SSC Projects (version 03) [9], the project has to meet the thresholds as defined in paragraphs 7 and 8 of the same Provisions. The type of small-scale project activity is II. So, the project has to be: Energy efficiency improvement project which reduce energy consumption, on the supply and/or demand side, by up to 60 gigawatt hours (GWh) per year (or an appropriate equivalent).

The project has following features:
1. The project is a demand-side energy efficiency activity, which eventually leads to the reduction of electricity consumption.
2. The activity includes energy-efficient measures.
3. The energy savings for monitoring period is 3.72 GWh per 19 months. The annual energy savings of the project activity is estimated to be about 2.35 GWh/year.

Thus, the project doesn't exceed the threshold level (60 GWh) and meets all requirements of Provisions for JI SSC Projects (version 03).

A.8. Intended deviations or revisions to the determined PDD and monitoring plan:

In accordance with the method to GHG emissions monitoring provided in the section D.1. of the PDD, method that was used allowed calculating electricity consumption in baseline scenario and project scenario only for different groups of devices (20 W or 32 W). This method did not allow calculating emissions separately for different types of buildings or time period. With aim to increase accuracy of calculation new method was used. Thus, the revision of the approved monitoring plan allows calculating electricity consumption for different:
-the group of "i" devices (i.e. 20 W and 32 W CFLs);
- the type of day (workday or non-workday) - "j";
- the season (winter, spring, summer, and autumn) - "k";
- the type of building (school, kindergarten, medicine and other) - "l".

The corrections of the approved monitoring plan allow increasing accuracy of calculation of GHG emissions reduction under the project and baseline scenario and do not require the introduction of any additional forms, LogBooks, etc., because all existed forms contained necessary fields for calculation by proposed method.

[9] http://ji.unfccc.int/Ref/Documents/Provisions_for_JI_SSC_projects.pdf

The detailed information on revised monitoring plan of the JI SSC Project "Implementation of energy-efficient lighting system in the Donetsk Region with the use of Kyoto Protocol mechanism: replacement of incandescent lamps with energy-efficient ones at budget financed and social entities in the Torez town (under Track 2)" is provided in Annex 1 to this Monitoring Report.

A.9. Changes since last verification:

Not applicable.

A.10. Person(s) responsible for the preparation and submission of the monitoring report:

Name of the person/entity for the preparation and submission of the monitoring report:

Innovation Center "Ecosystem"
Address: 28 Symona Petlyury str., Kyiv, Ukraine
Tel: +38 044 498-08-87
Fax: +38 044 248-70-72
Contact person: Dmitriy Danilkin
Email: dmitriy.danilkin@ic-ecosystem.com

SECTION B. Key monitoring activities

B.1. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.4.

First actual monitoring survey

The goal of the first monitoring survey is determining the following:

- Total number of CFLs installed in place of ICLs ($Q_{PJ,ijkl}$);
- power of replaced ICLs ($P_{i,BL}$);
- power of installed CFLs ($P_{i,PJ}$);
- number of operation hours of lighting instruments during a day (d_{ijkl});
- electricity consumption carbon emission factor for Ukraine ($EF_{CO2,ELEC,y}$).

The first actual monitoring effort took place in February 2011 (07/02/2011 – 28/02/2011). The effort included:

1. Monitoring of CFLs delivery and distribution;
2. Monitoring of CFLs installation;
3. Monitoring of ICLs disposal;
4. Monitoring of daily CFLs usage hours;
5. Monitoring of workdays and non-workdays days;
6. Monitoring of replacement of failed CFLs with new CFLs.

These activities are described below in detail:

1. CFLs were transferred from Carbon Futures to Innovation Center "Ecosystem" in January, 2011 (please see Transfer and Acceptance Act in supporting documents (SD-4)). Then CFLs were transferred from Innovation Center "Ecosystem" to City Council for distribution (please see Transfer and Acceptance Act in supporting documents (SD-2)).
2. CFLs were installed by City Council (please see REPORT OF ACCEPTANCE OF WORK ON REPLACEMENT in supporting documents (SD-3));
3. ICLs that were replaced were utilized for avoiding leakages (please see REPORT OF INCANDESCENT LAMP UTILIZATION in supporting documents (SD-5)).
4. The number of operation hours of lamps was fixed in the operation hours' log in each facility of the small-scale project. Then aggregated data was obtained from the facilities by Special Working Group of the Town and transmitted to Innovation Center "Ecosystem".
5. Information on workdays and non-workdays days is provided in tables A.1. and A.3.
6. Failed CFLs were replaced with new CFLs. Information on replacement was indicated in LogBooks on every facility of the project.

Periodic monitoring surveys

The goal of periodic monitoring survey is monitoring of the amount of operation hours of installed CFLs during a day; fraction of CFLs in local public buildings within budget funding; electricity consumption carbon emission factor for Ukraine.

The periodic monitoring took place in February (07/02/2011 – 28/02/2011), April (01/04/2011 – 30/04/2011), July (01/07/2011- 31/07/2011), October (01/10/2011 – 31/10/2011), February (01/02/2012 – 29/02/2012), April (01/04/2012 – 30/04/2012), July (01/07/2012 – 31/07/2012).

The effort included:

1. Monitoring of daily CFL usage hours.
2. Monitoring of workdays and non-workdays days.
3. Fraction of CFLs in local public buildings within budget funding.
4. Monitoring of replacement of failed CFLs with new CFLs.

These activities are described below in detail:

1. The number of operation hours of lamps was fixed in the operation hours' log in each facility of the small-scale project. Then aggregated data was obtained from the facilities by Special Working Group of the Town and transmitted to Innovation Center "Ecosystem".

The table below shows the monitoring plan of the operation hour's number of lighting instruments during a day.

Table B.1. OD_{ijkl} parameter survey plan

#	Attribute	Project plan
1	Goal	The goal is estimating the average number of CFL operation hours during the season (winter, spring, summer and autumn); during workdays and non-workdays; and for type of buildings where the lamp is installed.
2	Goal of operational measuring and data to be collected	The operation hours' logs are used for daily record of operation hours of lighting instruments in all facilities within 16 weeks per year for the full year (4 weeks in February, April, July and October). This data are used for calculation of average weighed value of daily operation hours. The average weighed values are effective within the whole crediting period.
3	Data collection period	Because of different duration of the light day, monitoring is conducted for 16 months per full year (4 weeks in February, April, July and October). The data received for four weeks during each season are used to calculate the average daily usage of CFLs for workdays and non-workdays during this season (OD_{ijkl}). This average value is used for calculating the total work-hours during the entire season. Since the CFL usage started on February 7 the total work hours for month of February were calculated based on daily monitoring for the period of February 7-28th, 2011.
4	Data collection method	Within the monitoring period, data is collected in the operation hours' logs by entering the start-stop timing and then calculating lamp operation hours during each monitoring day.

2. Information on workdays and non-workdays is provided in tables A.1. and A.3.
3. Failed CFLs were replaced with new CFLs. Information on replacement was indicated in LogBooks on site of facility location (every school, kindergarten, medical objects and other).
4. 190 pieces of failed CFLs were transferred from representatives of Town Council to Innovation Center "Ecosystem" on 17/11/2011 (Transfer and Acceptance Act in supporting documents (SD-6). Then failed CFLs were transferred to representatives of Carbon Futures for proper utilization on Nikitrtut Ltd. according to the Agreement on Utilization #L-1182 dated 24/10/2011 (SD-7).

5. The value of fraction of CFLs in public buildings within budget funding (F_{CFL}) was determined according to the letter # 774-01/13/4-12 dated 18 May 2012 obtained from State Agency on Energy Efficiency and Energy Saving of Ukraine, as an executive body responsible for the formation and implementation of unified state policy on energy saving (SD-8).

B.2. Data collection (accumulated data for the whole monitoring period):

Monitoring data (original logs, relevant acts and other documents) is collected in paper format and are kept for at least 2 years after the end of the crediting period. Aggregated information in Microsoft Excel format is saved on a hard drive and will be kept for at least 2 years by a representative of Innovation Center "Ecosystem" after the crediting period. To ensure reliability of information storage in the electronic format, files are backed up and saved on DVD and will be kept in the office of Innovation Center "Ecosystem" for at least 2 years after the crediting period.

To ensure the reliability of the monitoring data collection Innovation Center "Ecosystem" developed the document "Working Procedures" (SD-9) that includes:
- The order of primary data transmission.
- Procedure for LogBooks storage.
- Replacement procedure of failed lamps with new ones. Accounting of number of failed lamps.

The document "Working Procedures" was agreed with the head of the working group in the town and further distributed to each object.

B.2.1. List of fixed default values and ex-ante baseline factors:

Table B.2. Fixed default values

Variable	Source	Units	Value
Number (quantity) of devices of the group of "i" devices (i.e. 20 W and 32 W CFLs) $Q_{PJ,ijkl}$	Transfer and Acceptance Act (SD-3) and LogBooks	pieces	100 W: Schools: 2 718 Kindergartens: 2 281 Medicine: 2 135 Other: 945 150 W: Schools: 1 170 Kindergartens: 950 Medicine: 0 Other: 849
Power of the devices of the group of "i" baseline devices $P_{i,BL}$	Transfer and Acceptance Act (SD-3)	Watts	100 150
Power of the devices of the group of "i" project devices $P_{i,PJ}$	Transfer and Acceptance Act (SD-3)	Watts	20 32

B.2.2. List of variables:

Table B.3. Variables

Variable	Source	Units	Value
Electricity consumption carbon emission factor for Ukraine $EF_{CO2,ELEC,y}$	Order of National Environmental Investment Agency on approving of specific emissions of carbon dioxide in 2011	$kgCO_2/kWh$	1.227[10]
Average daily operating hours of the devices of the group of "i" baseline devices during workdays (j=1) and non-workday j=2); The average daily operational hours were estimated for different seasons (k) (due to changes in illumination needs). Winter (k=1), Spring (k=2), Summer (k=3) and Autumn (k=4). February average daily hours were used for winter; April hours for Spring and July hours for Summer seasons. The average daily operational hours were also estimated for type of buildings (l) where the lamp is installed (School, Kindergarten or Medicine). OD_{ijkl}	LogBooks	hours	See table B.4.
Fraction of CFLs in public buildings within budget funding ($F_{CFL,y}$)	According to the information obtained from state bodies responsible for the formation and implementation of unified state policy on energy saving and/or from state statistics	Fraction	0[11]

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

[11] The value of fraction of CFLs in public buildings within budget funding (F_{CFL}) was determined according to the letter # 774-01/13/4-12 dated 18 May 2012 obtained from State Agency on Energy Efficiency and Energy Saving of Ukraine, as an executive body responsible for the formation and implementation of unified state policy on energy saving (SD-8).

Table B.4. Average daily operating hours

Item / Period		Schools		Kindergartens		Medicine		Other	
		20 W	32 W	20 W	32 W	20 W	32 W	20 W	32 W
February 2011	workday	10.92	9.65	9.59	9.71	13.93	0.00	9.57	9.48
	non-workday	2.54	1.53	3.43	1.63	12.27	0.00	6.36	8.19
March-May 2011	workday	6.33	4.33	8.18	6.05	13.73	0.00	8.24	8.93
	non-workday	3.08	1.93	1.39	1.51	12.22	0.00	4.84	7.37
June-August 2011	workday	0.51	0.26	3.86	2.82	12.96	0.00	5.06	8.53
	non-workday	0.51	0.26	2.10	1.37	10.09	0.00	4.05	7.86
September-November 2011	workday	6.25	5.47	8.54	8.30	13.05	0.00	6.47	9.10
	non-workday	3.44	2.50	3.53	1.61	8.33	0.00	5.27	7.88
December 2011-February 2012	workday	11.07	10.17	9.59	10.10	13.83	0.00	9.79	9.70
	non-workday	2.73	1.80	3.36	1.81	8.91	0.00	4.50	8.29
March-May 2012	workday	8.73	7.66	8.21	9.21	13.80	0.00	9.92	10.42
	non-workday	2.79	1.77	3.38	1.84	8.91	0.00	3.88	8.28
June-August 2012	workday	0.41	0.26	2.86	2.51	7.78	0.00	3.10	4.38
	non-workday	0.40	0.26	1.24	1.03	5.65	0.00	1.65	3.82

B.2.3. Data concerning environmental impacts:

The environmental impacts derived through the project activity are such positive ones as energy savings.

B.3. Special event log:

No special events.

SECTION C. Quality assurance and quality control measures

C.1. Documented procedures and management plan:

C.1.1. Roles and responsibilities:

Roles and responsibilities of project participants are indicated in section A.8.5.

Frequency of reporting for monitoring period (07/02/2011 – 31/08/2012) was the following. Facility Managers recorded operational hours and number of lamps each day. Special Working Group and Project Coordinator aggregated data obtained from the each facility in February, April, July and October in 2011 and in February, April and July in 2012 and calculated emission reductions for whole monitoring period.

C.1.2. Trainings:

Staff involved in the project implementation and checks was trained according to the log filling instructions that are provided in each LogBook. The training facts are fixed in the training protocols (see minutes of the meeting on Philips energy efficient lamp monitoring in educational and healthcare facilities (SD-10)).

Each LogBook contains information on necessary organizational and functional steps for filling it in. These instructions are provided below:
1. Operation time of only 20 W and 32 W Philips Tornado energy saving lamps is recorded in this log.
2. Each institution/facility appoints a Person Responsible for filling in the operation hours' Log.
3. In each facility, recording the lamp's operation time, all lamps are broken into groups.
4. In every facility the amount of groups is decided subject to the lamp operation specifics in that facility.
5. Each group is assigned a separate operation hours' log form where the operation time of all lamps is recorded.
6. Operation hours' log is filled in every day.
7. For each group, the total amount of 20 W and 32 W installed lamps is counted separately.
8. Turn-on time column shows the first switching time for lamps of a certain group.
9. Turn-off time column shows the last switching time for lamps of a certain group. If the lamp turn-off or turn-on repeats during a day, these intervals are pointed in a separate line.
10. The column "Amount of working hours" shows the lamp group working time in certain day (in cases of several turn-on and turn-off intervals, they are summed up).

C.2. Internal audits and control measures:

Project monitoring includes all procedures required for supplies, installation, operation, and continuous replacement of Philips energy efficiency lamps. The Innovation Center "Ecosystem" is responsible for data collection and reporting. Municipal authorities have created a Special Working Group (SWG) to provide permanent project implementation supervision in the form of internal checks.

At each facility a responsible person or manager carries out a specific task of the project implementation monitoring and required protection. Internal checks of sites are performed by SWGs to ensure the proper project implementation.

Basic principles of internal site checks

1. Internal check should be performed once a month at least, and each facility under each department should be visited.
2. Facilities should not be checked more than once.

3. The facility should be checked again in case of detected significant violations of the project procedures in order to supervise correcting actions following results of the previous check.
4. A representative of the municipal council SWG shall perform internal checks.
5. Upon facility inspection the following should be checked:
   -availability of Philips energy efficiency lamps and their proper use;
   - availability of energy efficiency lamp acceptance certificates;
   - availability of the operation hours' log;
   - maintenance of the operation hours' log;
   - availability of certificates for out of order energy efficiency lamps;
   - availability of the "Out of Order Lamps" Form;
   - awareness of responsible persons and facility managers of the procedures of initial data transfer, keeping of logs and replacement of out of order lamps with the new ones.
6. According to check results, the Protocol reflecting all detected non-conformities during the inspection is drawn. Its form (example) is provided in supporting documentation (SD-11).

C.3. Troubleshooting procedures:

During the monitor period there were no special events. Therefore, there are no deviations from monitoring plan of GHG emission reduction.

SECTION D. Calculation of GHG emission reductions

D.1. GHG emissions reduction:

D.1.1. Project emissions:

Results for Emission Reduction for Monitoring Period are shown below. The calculation is provided in supporting documentation.

Table D.1. Result for project emissions

Period	Project Emissions, tCO_2
February, 2011*	63
March-May, 2011	201
June-August, 2011	126
September-November,2011	209
December 2011-February 2012	259
March-May, 2012	234
June-August, 2012	77
Total	1 169

***** - 07/02/2011-28/02/2011

D.1.2. Baseline emissions:

Results for Emission Reduction for Monitoring Period are shown below. The calculation is provided in supporting documentation.

Table D.2. Result for baseline emissions calculation

Period	Baseline Emission, tCO_2
February, 2011*	309
March-May, 2011	987
June-August, 2011	618
September-November,2011	1 023
December 2011-February 2012	1 270
March-May, 2012	1 143
June-August, 2012	380
Total	5 730

***** - 07/02/2011-28/02/2011

D.1.3. Leakage:

No Leakages.

D.1.4. Summary of the emissions reductions during the monitoring period:

Results for Emission Reductions for Monitoring Period are shown below. The calculation is provided in supporting documentation.

Table D.3. Emission reductions

Period	Project emissions (tonnes of CO_2 equivalent)	Leakage (tonnes of CO_2 equivalent)	Baseline emissions (tonnes of CO_2 equivalent)	Emission reductions (tonnes of CO_2 equivalent)
February, 2011*	63	0	309	246
March-May, 2011	201	0	987	786
June-August, 2011	126	0	618	492
September-November,2011	209	0	1 023	814
December 2011-February 2012	259	0	1 270	1011
March-May, 2012	234	0	1 143	909
June-August, 2012	77	0	380	303
Total (tonnes of CO_2 equivalent)	1 169	0	5 730	4 561

***** - 07/02/2011-28/02/2011

Table D.4. Emission reductions divided by years

Year	Project emissions (tonnes of CO_2 equivalent)	Leakage (tonnes of CO_2 equivalent)	Baseline emissions (tonnes of CO_2 equivalent)	Emission reductions (tonnes of CO_2 equivalent)
2011*	687	0	3 368	2 681
2012**	482	0	2 362	1 880
Total (tonnes of CO_2 equivalent)	1 169	0	5 730	4 561

* -07/02/2011 – 31/12/2011

**- 01/01/2012 – 31/08/2012

Annex 1

Revised Monitoring plan of JI SSC Project

Implementation of energy-efficient lighting system in the Donetsk Region with the use of Kyoto Protocol mechanism: replacement of incandescent lamps with energy-efficient ones at budget financed and social entities in the Torez town (under Track 2)

Revision 01.1
07/02/2013

A.1. Description of revisions to the monitoring plan:

With aim to calculate complete GHG emissions under the project and baseline scenario, following corrections in monitoring plan are taken:

In accordance with the method to GHG emissions monitoring provided in the section D.1. of the PDD, method that was used allowed calculating electricity consumption in baseline scenario and project scenario only for different groups of devices (20 W or 32 W). This method did not allow calculating emissions separately for different types of buildings or time period. With aim to increase accuracy of calculation new method was used. Thus, the revision of the approved monitoring plan allows calculating electricity consumption for different:
-the group of "i" devices (i.e. 20 W and 32 W CFLs);
- the type of day (workday or non-workday) - "j";
- the season - "k" (winter, spring, summer, and autumn);
- the type of building (school, kindergarten, medicine and other) - "l".
This increases accuracy of emission reduction calculation.

A.2. Revisions in the formulas for calculating emission reductions to the determined PDD and monitoring plan:

Method that was used for calculation of emission reductions in the PDD:

Stage1. Baseline emissions calculation

Step1. The electricity consumption in baseline scenario in year 'y' was calculated according to formula 1:

$$EC_{BL,y} = \sum_{i=1}^{n} Q_{BL,i} \cdot P_{i,BL} \cdot O_i \cdot 365/1000 \quad (1)$$

Where:
$EC_{BL,y}$ - Baseline electricity consumption in year *y*, kWh;
$\sum_{i=1}^{n}$ – Sum over the group of "i" devices (i.e. 100 W and 150 W ICLs), pieces;
$Q_{BL,i}$ - Number (quantity) of devices of the group of "i" devices (i.e. 100 W and 150 W ICLs);
$P_{i,BL}$ - Power of the devices of the group of "i" baseline devices, W;
O_i - Average daily operating hours of the devices of the group of "i" baseline devices, hours.

Step 2. The emission in the baseline scenario in year '*y*' was calculated according to formula 2:

$$BE_y = EC_{BL,y} \cdot (1 - F_{CFL,y}) \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad (2)$$

Where:

BE_y – Baseline emissions in year, t CO_2;
$EC_{BL,y}$ - Electricity consumption in year *y*, kWh;
$F_{CFL,y}$ – Fraction of CFLs in local public buildings within budget funding, fraction;
$EF_{CO2,ELEC,y}$ - Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh;

Stage2. Project emissions calculation

Step1. The electricity consumption by the project activity in year 'y' was calculated according to formula 3:

$$EC_{PJ,y} = \sum_{i=1}^{n} Q_{PJ,i} \cdot P_{i,PJ} \cdot O_i \cdot 365/1000 \quad (3)$$

Where:
$EC_{PJ,y}$ - Project electricity consumption in year y, kWh;
$\sum_{i=1}^{n}$ – Sum over the group of "i" devices (i.e. 20 W and 32 W CFLs);
$Q_{PJ,i}$ - Number (quantity) of devices of the group of "i" devices (i.e. 20 W and 32 W CFLs), pieces;
$P_{i,PJ}$ - Power of the devices of the group of "i" project devices, W;
O_i - Average daily operating hours of the devices of the group of "i" devices, hours.

Step 2. The emission by the project activity in year 'y' was calculated according to formula 4:

$$PE_y = EC_{PJ,y} \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad (4)$$

Where:
PE_y – Project emissions in year *y*, tCO_2;
$EC_{PJ,y}$ - Electricity consumption in year *y*, kWh;
$EF_{CO2,ELEC,y}$ - Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh.

Stage 3. Leakages

No leakages.

Stage 4. GHG emission reductions in year 'y' (ERy) are estimated according to formula 5:

$$ER_y = (BE_y - PE_y) - LE_y \quad (5)$$

Where:
ER_y – Emission reductions in year 'y', tCO_2e;
BE_y – baseline GHG emissions in year 'y', tCO_2e;
PE_y- project GHG emissions in year 'y', tCO_2e;
LE_y – Leakage emissions in year 'y', tCO_2e.

Method that is used for calculation of emission reductions in the revised monitoring plan:

Stage1. Baseline emissions calculation

Step1. The electricity consumption in baseline scenario in year 'y' is calculated according to formula 6:

$$EC_{BL,y} = \sum_{i,j,k,l=1}^{n} Q_{BL,ijkl} \cdot P_{i,BL} \cdot OD_{ijkl} \cdot d_{ijkl} / 1000 \quad (6)$$

Where:
$EC_{BL,y}$ - Baseline electricity consumption in year 'y', kWh;
$\sum_{i,j,k,l=1}^{n}$ – Sum over :
- the group of "i" devices (i.e. 100 W and 150 W ICLs);
- the type of day (workday or non-workday) - "j";
- the season (winter, spring, summer and autumn) - "k";
- the type of building (school, kindergarten, medicine) - "l":

$Q_{BL,ijkl}$ - Number (quantity) of devices of the groups "i", pieces;
$P_{i,BL}$ - Power of the devices of the group of "i" baseline devices, W;
OD_{ijkl} – Average daily operating hours of the devices of the group of "i" baseline devices for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l
d_{ijkl} - Number of days of monitoring period for groups 'i' of devices; for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l

Step 2. The emission in baseline scenario in year 'y' is calculated according to formula 7:

$$BE_y = EC_{BL,y} \cdot (1 - F_{CFL,y}) \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad (7)$$

Where:
BE_y – Baseline emissions in year, t CO_2;
$EC_{BL,y}$ - Electricity consumption in year y, kWh;
$F_{CFL,y}$ - Fraction of CFLs in local public buildings within budget funding, fraction;
$EF_{CO2,ELEC,y}$ - Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh;

Stage2. Project emissions calculation

Step1. The electricity consumption by the project activity in year 'y' is calculated according to formula 8:

$$EC_{PJ,y} = \sum_{i,j,k,l=1}^{n} Q_{PJ,ijkl} \cdot P_{i,PJ} \cdot OD_{ijkl} \cdot d_{ijkl} / 1000 \quad (8)$$

Where:
$EC_{PJ,y}$ - Project electricity consumption in year 'y', kWh;
$\sum_{i,j,k,l=1}^{n}$ – Sum over :
- the group of "i" devices (i.e. 20 W and 32 W CFLs);
- the type of day (workday or non-workday) - "j";
- the season (winter, spring, summer and autumn) - "k";
- the type of building (school, kindergarten, medicine, other) - "l":

$Q_{PJ,ijkl}$ - Number (quantity) of devices of the groups "i", pieces;
$P_{i,PJ}$ - Power of the devices of the group of "i" project devices, W;
OD_{ijkl} – Average daily operating hours of the devices of the group of "i" devices for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l;
d_{ijkl} - Number of days of monitoring period for groups 'i' of devices; for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l;

Step 2. The emission by the project activity in year 'y' is calculated according to formula 9:

$$PE_y = EC_{PJ,y} \cdot EF_{CO2,ELEC,y} \cdot 10^{-3} \quad (9)$$

Where:

PE_y – Project emissions in year 'y', t CO_2;
$EC_{PJ,y}$ - Electricity consumption in year 'y', kWh;
$EF_{CO2,ELEC,y}$ - Electricity consumption carbon emission factor for Ukraine, kg CO_2/kWh.

Stage 3. Leakages

No leakages.

Stage 4. GHG emission reductions in year 'y' is calculated according to formula 10

$$ER_y = (BE_y – PE_y) - LE_y \quad (10)$$

Where:
ER_y – Emission reductions in year 'y', tCO_2e;
BE_y – baseline GHG emissions in year 'y', tCO_2e;
PE_y- project GHG emissions in year 'y', tCO_2e;
LE_y – Leakage emissions in year 'y', tCO_2e.

A.3. Data to be monitored according to the revised monitoring plan:

Parameters required for estimation of emission reductions according to the revised monitoring plan include:

1. Parameters continuously monitored within the entire crediting period:

- Average daily operating hours of the devices of the group of "i" devices for workdays (j=1) and non-workdays (j=2); during the season k; for the type of building l (OD_{ijkl});
- Number of days of monitoring period for group of devices 'i'; for workdays (j=1) and non-workdays (j=2); during the season 'k'; for the type of building 'l' (d_{ijkl});
- Electricity consumption carbon emission factor for Ukraine ($EF_{CO2,ELEC,y}$);
- Fraction of CFLs in local public buildings within budget funding ($F_{CFL,y}$).

2. Parameters which are determined once and are taken as constants for the whole monitoring period. They are available at the stage of determination:

- Number of ICLs replaced ($Q_{BL,ijkl}$);
- Power rating of replaced ICLs ($P_{i,BL}$);
- Power rating of CFLs installed (being installed, $P_{i,PJ}$);

3. Parameters which are determined once and are taken as constants during monitoring but are not available at the stage of determination:

Absent.

Data to be monitored:

Data / Parameter	$Q_{PJ,ijkl}$
Data unit	Pieces
Description	Number (quantity) pieces of equipment of type 'i' distributed or installed under the project activity (units) instead of ICLs in each kind of facility; the power rating of the CFL is 20W or 32W.
Time of determination/monitoring	During the replacement phase.
Source of data (to be) used	Actual CFL distribution during the project and SD-1 (Installed CFLs in each type of facilities)
Value of data applied (for ex ante calculations/determinations)	20 W: Schools: 2 718 Kindergartens: 2 281 Medicine: 2 135 Other: 945 32 W: Schools: 1 170 Kindergartens: 950 Medicine: 0 Other: 849
Justification of the choice of data or description of measurement methods and procedures (to be) applied	This number is a constant value once all of the project's CFLs are distributed.
QA/QC procedures (to be) applied	Standardised forms were used for the data collection during the survey and the people responsible for conducting the survey on ground was reasonably educated about the project. Additionally, there were experts and reliable personnel from the project participants to oversee the overall process.
Any comment	

Data / Parameter	$Q_{BL,ijkl}$
Data unit	Pieces
Description	Number (quantity) of devices of the group of "i" devices (i.e. 100W and 150W incandescent lamp)
Time of determination/monitoring	During the replacement phase.
Source of data (to be) used	Real amount of ICLs which were collected on the replacement phase and were utilized according to Report on Incandescent Lamp Utilization (SD-5).
Value of data applied (for ex ante calculations/determinations)	20 W: Schools: 2 718 Kindergartens: 2 281 Medicine: 2 135 Other: 945 32 W: Schools: 1 170 Kindergartens: 950 Medicine: 0 Other: 849
Justification of the choice	This is a constant. Its value not depends on the year 'y' of the project

of data or description of measurement methods and procedures (to be) applied	activity.
QA/QC procedures (to be) applied	Standardised forms will be used for the data collection during the survey and the people responsible for conducting the survey on ground will be reasonably educated about the project. Additionally, there will be experts and reliable personnel to oversee the overall process.
Any comment	

Data / Parameter	OD_{ijkl}
Data unit	Hours
Description	Average daily operating hours of the devices of the group of "i" baseline devices during workdays (j=1) and non-workday j=2); The average daily operational hours were estimated for different seasons (k) (due to changes in illumination needs). Winter (k=1), Spring (k=2), Summer (k=3) and Autumn (k=4). February average daily hours were used for winter; April hours for Spring and July hours for Summer seasons. The average daily operational hours were also estimated for type of buildings (l) where the lamp is installed (School, Kindergarten, Medicine or Other).
Time of determination/monitoring	Monitoring during credit periods
Source of data (to be) used	The number of operation hours of lamps is fixed in the operation Log Books on each facility.
Value of data applied (for ex ante calculations/determinations)	See section B.2.2.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The number of operation hours within a day is determined by continuous measuring of ICL usage hours within 120 days of representation period of lighting instrument operation (in February, April, July, and October). Paper operation hours' logs are used for these measurements. To obtain the total number of operation hours, these records will be processed and extrapolated for the entire project. Healthcare and educational institutions (2 types – Schools and Kindergartens) and Others are 4 different groups of facilities within the project. Therefore, for estimation of achieved final value of emission reduction units (ERUs), the average weighted value of operation hours will be used.
QA/QC procedures (to be) applied	To control the quality of data records by local authorities, inspections are initiated. (The example is provided in supporting documentation SD-11).
Any comment	

Data / Parameter	$P_{i, BL}$
Data unit	Watts
Description	Rated power of the baseline lighting devices of the group of "i" lighting devices (Watts)
Time of determination/monitoring	During the replacement phase.
Source of data (to be) used	Weighted Average Power Rating of the baseline ICLs as recorded during lamp distribution
Value of data applied	ICL of following two power rating would be replaced as part of the

(for ex ante calculations/determinations)	project activity. These are 100W (8 079 pieces) and 150W (2 969 pieces).
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The power rating recorded on each ICL will be considered as the primary source of this data. In cases where the wattage label is not visible, a portable power meter will be used to determine the rating on the spot.
QA/QC procedures (to be) applied	Standardised forms will be used for the data collection during the distribution and the people responsible for distribution on ground will be reasonably educated about the project. Additionally, there will be experts and reliable personnel to oversee the overall process.
Any comment	This data was verified during the ICL utilization (SD-5).

Data / Parameter	$P_{i,PJ}$
Data unit	Watts
Description	Rated power of the project lighting devices of the group of "i" lighting devices (Watts)
Time of determination/monitoring	During the replacement phase.
Source of data (to be) used	CFL power rating recorded during distribution.
Value of data applied (for ex ante calculations/determinations)	Project activity envisages distribution of 2 type power rating CFLs. They are 20W (8 079 pcs.) for replacement of 100W and 32W ICLs (2 969pcs.) for replacement of 150W ICLs.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The power rating mentioned on the CFLs will be recorded during the lamp distribution.
QA/QC procedures (to be) applied	Standardised forms will be used for the data collection during the distribution and the people responsible for distribution on ground will be reasonably educated about the project. Additionally, there will be experts and reliable personnel from the project participants to oversee the overall process.
Any comment	This data has been checked upon CFL transfer (in accordance with the CFL transfer certificate SD-2 and transfer and acceptance act SD-3).

Data / Parameter	d_{ijkl}
Data unit	Days
Description	Number of days of monitoring period for group of devices; for workdays (j=1) and non-workdays (j=2); during the season (k); for the type of building (l).
Time of determination/monitoring	Monitoring during credit periods.
Source of data (to be) used	Calendar and Public Holidays in Ukraine
Value of data applied (for ex ante calculations/determinations)	According to calendar and public holidays during chosen monitoring period.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Total amount of workdays and non-workdays changes according to the calendar. Medicine facilities in Torez Town work 6 days a week. Their work schedules don't depend on holidays. Schools, Kindergartens and Others have 5 work days per week. Also, these facilities don't work on public holidays in Ukraine. The full list of

	public holidays in Ukraine is: - January 1 - New Year's Day; - January 7 - Orthodox Christmas; - March 8 - International Women's Day; - Orthodox Easter; - May 1 & 2 - Labour Days; - May 9 - Victory Day; - Holy Trinity Day (Triytsya) - Orthodox Pentecost; - June 28 - Constitution Day; - August 24 - Independence Day.
QA/QC procedures (to be) applied	Experts and reliable personnel from the project participants will oversee for working and non-working days in LogBooks and in aggregated data.
Any comment	Amount of working and non-working days could be checked by calendar.

Data / Parameter	$F_{CFL,y}$
Data unit	Fraction
Description	Fraction of CFLs in local public buildings within budget funding
Time of determination/monitoring	Annually
Source of data (to be) used	According to the information obtained from state bodies responsible for the formation and implementation of unified state policy on energy saving and/or from state statistics
Value of data applied (for ex ante calculations/determinations)	0
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Despite the gradual penetration of energy efficient lamps in the Ukrainian market, state funding of the large-scale replacement of ICLs with CFLs in the public sector is not sufficient. Information concerning the enforcement of the Ordinance # 1337-r "On Implementation of Measures to Reduce Electricity Consumption by Budget Institutions" in other cities of Ukraine during the crediting period will be monitored annually by project participants in order to justify that the project continue to be not a common practice.
QA/QC procedures (to be) applied	Data will be obtained on the request of project coordinator, Innovation Center "Ecosystem" from state bodies responsible for the formation and implementation of unified state policy on energy saving and/or from state statistics.
Any comment	The value of this parameter represents the penetration rate of CFLs in local public buildings within budget funding

Data / Parameter	$EF_{CO2,ELEC,y}$
Data unit	kg CO_2/kWh
Description	Specific indirect carbon dioxide emissions from electric power consumption by the 2nd voltage class consumers[12] in 'y' year. It shows emission of GHGs in CO_2 equivalent for production and transportation electricity for consumers.
Time of	Monitoring during credit periods.

[12] For 2nd voltage class consumers belongs costumers and subcostumers which buy electricity in grid with voltage 27.5 kV and lower (http://www.nerc.gov.ua/?id=1053).

determination/monitoring	
Source of data (to be) used	National Environmental Investment Agency of Ukraine.
Value of data applied (for ex ante calculations/determinations)	For 2011, the value is 1.227[13]. During the monitoring, this value will be updated in accordance with orders of the State Environmental Investment Agency of Ukraine. For preliminary estimates, the value for 2011 is used.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	No measurement required.
QA/QC procedures (to be) applied	Data will be obtained from orders of the State Environmental Investment Agency of Ukraine.
Any comment	

A.4. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored to the revised monitoring plan:

Data/Parameter	QA/QC procedures to be applied:
$Q_{PJ,ijkl}$	Power of CFLs and their amount are confirmed by relevant certificates of completed works. (Please see supporting documentation : SD-1; SD-2; SD-3; SD-4)
$P_{i,PJ}$	
$Q_{BL,ijkl}$	Power of replaced ICLs and their amount are confirmed by relevant transfer acts and report on utilization. (Please see supporting documentation: SD-3, SD-5)
$P_{i,BL}$	
OD_{ijkl}	To ensure proper quality of records in the operation LogBooks, the personnel responsible for operation time logging, lamp keeping and removal has been trained (SD-10). To ensure quality control, a special working group performs LogBooks maintenance inspections. Please see supporting materials for inspection examples (SD-11).
d_{ijkl}	Experts and reliable personnel from the project participants will oversee for workdays and non-workdays in LogBooks and in aggregated data.
$F_{CFL,y}$	This parameter will be monitored annually by project participants according to the information obtained from state bodies responsible for the formation and implementation of unified state policy on energy saving and/or state statistics.
$EF_{CO2,ELEC,y}$	Data will be obtained from following orders of the State Environmental Investment Agency of Ukraine.

Additional information on QA/QC procedures are provided in sections C.1.2. and C.2. of this Monitoring Report.

A.5. Operational and management structure that will be applied in implementing the revised monitoring plan:

The operation and management structures were not changed for revised Monitoring Plan. Details are provided below.

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

The project coordinator Innovation Center "Ecosystem" is in charge of data collection and reporting. The Torez administration has assembled the special working group (SWG) to oversee the project implementation. Each building supervisor/manager has a separate task of monitoring and safeguarding the project implementation. Random inspections are conducted by SWG in the buildings to ensure proper project implementation.

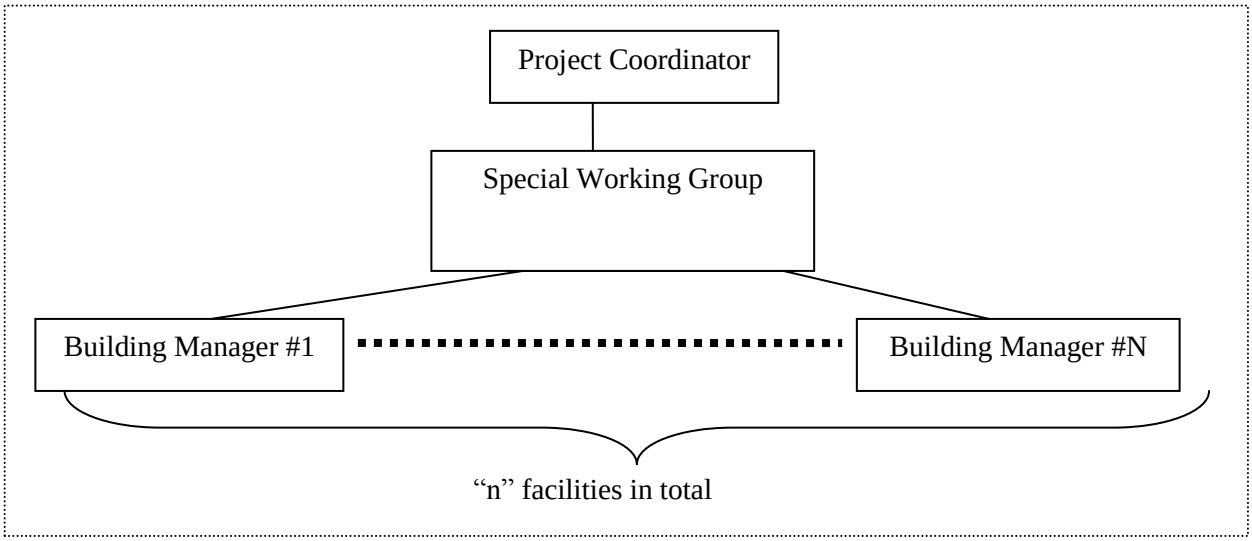

Figure A.1. Management structure

Table A.6. Responsibilities of project participants

Position	***Role***	***Frequency of Reporting***
Project Coordinator	Management of the project. Responsible for GHG emission reductions calculation and monitoring.	February, April, July; October
Special Working Group	Aggregation of data obtained from the facilities taking into account the type of facility where CFLs are installed. Administration and oversight of the project.	February, April, July; October
Facility Managers	Recording operational hours and number of lamps; conducting lamp replacement. Names of facility managers are indicated in supporting documents.	Daily

A.6. Justification of deviations of approved monitoring plan:

The revision of the approved monitoring plan allows calculating electricity consumption for different:
-the group of "i" devices (i.e. 20 W and 32 W CFLs);
- the type of day (workday or non-workday) - "j";
- the season (winter, spring, summer, and autumn)- "k";
- the type of building (school, kindergarten, medicine or other) - "l".

The corrections of the approved monitoring plan allow increasing accuracy of calculation of GHG emissions reduction under the project and baseline scenario.
The corrections of the approved monitoring plan do not require the introduction of any additional forms, LogBooks, etc., because all existed forms contained necessary fields for calculation by proposed method.