
VERIFICATION AND CERTIFICATION REPORT

Cool nrg Carbon Investments Pty Ltd
PoA- 2535‘CUIDEMOS Mexico
(Campana De Uso Inteligente De
Energia Mexico)- Smart Use of
Energy Mexico’
CPA-2535-0001‘CUIDEMOS Mexico
(Campana De Uso Inteligente De
Energia Mexico)- Puebla’

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Date of Issue:		Project Number:		
23/10/2012		CDM.VER0993 PoA		
Project Title:				
PoA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico CPA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla				
Organisation:		Client:		
SGS United Kingdom Limited		Cool nrg Carbon Investments Pty Ltd		
Publication of Monitoring Report:				
Monitoring Period:		01/12/2009 – 30/11/2010		
First Monitoring Version and Date:		Version 01, dated 04/01/2011		
Final Monitoring Version and Date:		Version 07, dated 11/10/2012		
Summary:				
<p>SGS United Kingdom Limited has performed the first verification of the PoA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico' & CPA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla' UN number PoA:2535 & CPA:2535-0001. The verification includes confirming the implementation of the monitoring plan of the registered PoA-DD and CPA-DD, UN number PoA:2535 & CPA:2535-0001, and the application of the monitoring methodology as per AMS II.C version 09, EB 33. A site visit was conducted to verify the data submitted in the Monitoring Report. SGS confirms the following has been reviewed;</p> <ul style="list-style-type: none"> • The registered PoA-DD and CPA-DD including the monitoring plan and the corresponding validation report for PoA-DD and CPA-DD; • Monitoring report; • The applied monitoring methodology; • Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board; • All information and references relevant to the project activity's resulting in emission reductions <p>The project activity involves the free distribution of CFL to the households and replacing the incandescent bulbs which would have been used in the absence of the project activity. The difference in the energy consumption between CFL and incandescent bulb would be the saving of the electricity that would have been generated by using the fossil fuel at national grid.</p> <p>SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 19,241 tCO₂e emission reductions during period 01/12/2009 to 30/11/2010.</p>				
Subject:				
PoA, CPA Verification				
Verification Team:				
Shivaji Chakraborty – Lead Assessor Magdalena Cruz– Local Assessor Shivaji Chakraborty– Technical Expert TA.3.1		<input checked="" type="checkbox"/> No Distribution (without permission from the Client or responsible organisational unit) <input type="checkbox"/> Limited Distribution <input type="checkbox"/> Unrestricted Distribution		
Technical Review:				
Date: 25-10-2012 Name: Joe Sun				
Authorised Signatory:				
Name: Siddharth Yadav Date: 09/11/2012		<input type="checkbox"/> Unrestricted Distribution		
Revision Number:	Date:			Number of Pages:
0	03/03/2011			47
1	16/03/2011			48
2	23/05/2011	49		

3	30/09/2011	69	
4	14/10/2011	58	
5	30/07/2012	63	
6	23/10/2012	71	

Abbreviations

CAR	Corrective Action Request
CER	Certified Emission Reduction
CFL	Compact Florescent Lamp
CL	Clarification Request
CPA-DD	CDM Programme of Activities Design Document
CoP	Conference of Parties
DMS	Data Management System
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
IEC	International Electro-Technical Commission
GHG	Green House Gas Emissions
ILB	Incandescent Light Bulb
kW	Kilo Watt
kWh	Kilo Watt Hours
ME	Managing Entity
MoP	Modalities of Parties
MP	Monitoring Plan
MR	Monitoring Report
PoA	Programme of Activities
PoA-DD	Programme of Activity Design Document
UNFCCC	United Nation Framework Convention on Climate Change
VVM	Validation and Verification Manual
W	Watt

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1. Introduction

1.1 Objective

SGS United Kingdom Limited has been contracted by Cool nrg Carbon Investments Pty Ltd. to perform an independent first verification of its PoA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico' & CPA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla' UN number 2535-0001. PoA-CPA must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this first verification exercise are, by review of objective evidence, to establish that:

- I. The emissions report conforms with the requirements of the monitoring plan in the registered PoA-DD, CPA-DD and the approved methodology; and
- II. The data collection and archiving are complete and transparent.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered PoA DD, CPA-DD and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of PoA:	CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico
Title of CPA:	'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico)- Puebla'
UNFCCC Registration Number:	PoA-2535 and CPA 2535-0001
Monitoring Period Covered in this Report	01/12/2009 to 30/11/2010
Project Participants	Cool nrg Mexico SRL de CV Standard Bank Plc Eneco Energy Trade B.V. Cool nrg Carbon Investments Pty Ltd
Location of the Project Activity:	Various households in the State of Puebla, Mexico

2. Methodology

2.1 General Approach

SGS' approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

Verification Team	Role
Shivaji Chakraborty	Lead Assessor
Magdalena Cruz	Local Assessor
Shivaji Chakraborty	Sectoral Expert TA 3.1

Technical Review Team	Role
Joe Sun	Technical Reviewer
Sandeep Kurmi	Sectoral Expert TA 3.1

2.3 Means of Verification

2.3.1 Review of Documentation

The validated PoA-DD, CPA-DD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed by all members of the assessment team at various households in the state of Puebla in the cities of Puebla, Atlixco, Izucar, Tehuacan, Zacatlan, Cd Serdan, San Martin, Teziutlan, Chalchicomula and Huachinango and office of the coordinating and managing entity;

Location: State of Puebla, Mexico	
Date: 24/01/2011 to 27/01/2011	
Coverage:	Source of Information / Persons Interviewed
Review of performance records, interviews with project participants,	Chris Tierney, General Manager Business Services, cool nrg International Pty Ltd Gabrielle Henry, cool nrg International Pty Ltd (Available through conference call and video chat) Manuel Rosemberg, Country Manager Cool nrg
Collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment	Alan Gallart, Logistics, Cool nrg House hold owners in Puebla State in the cities of Puebla, Atlixco, Izucar, Tehuacan, Zacatlan, Cd Serdan, San Martin, Teziutlan, Chalchicomula and Huachinango

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

1. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
2. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
3. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

Corrective Action Requests and Clarification requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and Observations.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period. Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 Project Implementation - General

The project was implemented and equipment installed as described in the registered POA-DD^{/1/} and CPA-DD^{/2/}.

The report applies to the first verification of the first CPA entitled 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) - Puebla'. The PoA involves the free distribution of CFL in exchange of incandescent bulbs for household use. The total number of CFLs distributed under this first registered CPA is 987,146. The implementation of the CPA (exchange of bulbs) started on 31st October 2009 and ended on 30th November 2009. This schedule of distribution was found inline to the PoA-DD^{/1/} and CPA-DD^{/2/}. This was verified with the DMS all exchanges xls^{/11/} and cross verified with the letter from the distributor^{/3/}. The distribution schedule, corresponding to dates, has also been checked on site and was found to be acceptable^{/4/}.

However, the SGS assessment team observed, during the site visit, that the name plate (labelling) power capacities of the distributed CFL was not found in line to the CPA-DD. As per registered CPA-DD (section B.5.2), CFL provided to households will have the rated capacity of 15W and 20W (equivalent in lumen output to incandescent bulbs of at least 60W and 75W respectively). However, during the actual implementation of the first CPA the distributed CFL have been labeled as 14W and 18W. **CAR#01** was raised for the explanation in this regard.

The PP has responded that only the labeling, of the power capacities (wattage) on the CFLs, have been adjusted by the supplier just to give the different identification of the project CFLs from the existing CFLs in the market and the actual power capacities of these CFL are still 15W and 20W. Only labeling (wattage mentioned on the CFLs) has been changed from 15W & 20W to 14W and 18W, respectively. The assessment team has further examined the given arguments of the PP and observed that this adjustment in labeling has been done by the supplier to give the different identification to the project activity CFL from the others available in the Mexican market. The fact that the actual capacities remain the same has been further cross verified from the supplier's letter (Philips Electronics Hong Kong Limited)^{/3/} and found to be correct. This letter from Philips clearly states and confirms the following points;

- a) The CFLs used by the Coolnrg (Co-ordinating/Managing entity) are sold and distributed by Philips with the power capacities of 15 & 20 W.
- b) The CFLs had been available and marketed in Mexico by Philips as 15 & 20 W CFLs for the past 7 years
- c) The IEC (International Electro-Technical Commission) is the international standards and conformity assessment body for all fields of electro technology, including CFL'. As such IEC standard 60969^{/29/} provides manufacturer the flexibility to adjust stated CFL wattages within a tolerance of 15%; this permits the 15W to be legitimately labeled at 14W and the 20W likewise to be labeled as 18W.
- d) Given the Puebla CDM Project was providing CFLs free of cost to consumers, in direct competition with normal Retail outlets, and the ability to adjust stated Wattages under IEC standards, it was agreed to re-code the name plate capacities Coolnrg CFL bulbs as 14 & 18W CFL's. This apparently provided a differentiation between the free of cost bulbs on offer and those commonly available in the general marketplace for purchase via retail outlets (i.e. 15 & 20W CFL's).
- e) The re-labeling of these products specifically for Puebla as such, meets all International rules in relation to Wattage claims and in no way affects the bulb performance characteristics i.e. the 14W/18W Puebla Campaign CFLs are exactly the same bulb, with identical performance, to the Retail market 15W/20W CFLs that have existed for the past 7 years in Mexico.

After review of the submitted documents, the assessment team is of an opinion that the re-labeling was done with an intention to differentiate CFL distributed from the already available bulbs in the market and capacities of CFL remain the same (15 and 20 W) as mentioned in the registered CPA-DD^{/2/}. However, generally the labeled capacities of the electrical devices are used for the verification/audit purpose and in the case the actual labeled capacities of the CFL distributed in the CPA are different than the stated figures in registered CPA-DD^{/2/}. Therefore, in absence of the PoA specific procedures, to deal with the notification of the change in project design and put more transparency to the audit, at first instance SGS tried to apply CDM

procedures (EB48 Annex 66 and 67) to notify EB about this change in labeled capacities. Nevertheless, a clarification email was received by SGS from the UN CDM team (on behalf of entity support, dated 20th December, 2010) clearly mentioning that EB48, Annex 66 can not be applied as a default procedure for PoA. Under these situations, it has been re-assessed by SGS more critically and concluded that based on the information received from the supplier on this matter, the adjusted re-labeling is in accordance with IEC 60969 standard and serves the purpose of differentiation from the ones available in the open market. The adjusted labelling, in fact, does not change the rated capacity of the CFLs and project activity has been considered to be implemented as per description in the PoA DD/CPA DD as technically, in project activity 14W CFL is considered as 15W CFL and in the same way 18W CFL as 20W CFL. It must also be noted that on page 6 of PoA DD (section A.4.2.1), the rated capacities were anticipated. Thus, **CAR #01** was closed out satisfactorily.

CL#06 was raised as the MR did not include the title of CPA on page one of the MR and simply read CPA1. The PP corrected the MR which was checked and found to be consistent and hence accepted.

Thus **CL#06** was closed out.

3.2 Remaining Issues, CAR's, FAR's from Previous Validation or Verification

There are no outstanding issues observed from the validation report for PoA-DD and CPA-DD^{/9/}. The current report applies to first periodic verification activity has been conducted so far for this CPA.

3.3 Compliance of the monitoring plan with the monitoring methodology.

The monitoring plan of the registered project is in accordance with the applied methodology.

The monitoring plan of the registered project (PoA-DD & CPA-DD) is in accordance with the applied methodology. The project activity applies AMS II C version 09^{/10/} which requires the following parameters to be monitored and the confirmation of compliance of registered PoA-DD and CPA-DD to the applied methodology has been discussed below in detail;

3.3.1 Compliance of the PoA-DD & CPA-DD with applied methodology

- *If the device installed replace existing devices, the number and 'power' of the replaced device shall be recorded and monitored.*

The PoA-DD in its section E.7.1 mentioned the required parameters like n_i (Number of incandescent bulbs collected) and p_i (Watts of incandescent bulb) and also CPA-DD in its section B.6.1 requires the monitoring of number and power of the replaced device under 'Collection of Incandescent Nameplate Data'. Therefore, the requirement set by methodology for the monitoring of number of power of the replaced device has been met.

- *Monitoring shall consist of monitoring either the "power" and "operating hours" or the "energy use" of the devices installed using an appropriate methodology. Possible methodologies include: (a) Recording the "power" of the device installed (e.g., lamp or refrigerator) using nameplate data or bench tests of a sample of the units installed and metering a sample of the units installed for their operating hours using run time meters.*

The PoA-DD in its section E.7.1 mentioned the required parameters like n_k (number of operational CFL) and p_k (Watts of CFLs) and CPA-DD in its section B.6.1 requires the monitoring of number and power of the replaced device under 'Collection of CFL Nameplate Data'. Therefore, the requirement set by methodology for the monitoring of number of power of the replaced device has been met.

- *In either case, monitoring shall include annual checks of a sample of non-metered systems to ensure that they are still operating (other evidence of continuing operation, such as on-going rental/lease payments could be a substitute).*

The PoA-DD in its section E.7.1 mentioned under the parameter ' n_k (number of operational CFL)' that ongoing operation of the CFL will be checked a least annually in a sample of non-metered households. Similarly the CPA-DD in section B.6.1 mentioned the related parameter 'Establishment of project Cross-Check Sample Group' for the annual checks of non metered system. Therefore this was also found inline to applied methodology.

In addition to the above monitoring plan, there are few other requirements, as mentioned below, for the PoA;

4. *In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.*

The CPA-DD covers this requirement and there is a dedicated parameter for the independent check of the scrapped incandescent bulbs. This requirement has been met by the coordinating entity and further details on the verification aspects by SGS, please refer 3.2.1d.

3.3.2 Compliance of the monitoring plan of PoA-DD, CPA-DD and applied methodology with actual implementation on site

1. *If the device installed replace existing devices, the number and 'power' of the replaced device shall be recorded and monitored.*

The assessment team has confirmed on site that the rated power and number of the exchanged incandescent bulb was monitored on site^{/11/}. The number of incandescent bulbs was also cross checked with the third party report^{/12/}.

2. *Monitoring shall consist of monitoring either the "power" and "operating hours" or the "energy use" of the devices installed using an appropriate methodology. Possible methodologies include: (a) Recording the "power" of the device installed (e.g., lamp or refrigerator) using nameplate data or bench tests of a sample of the units installed and metering a sample of the units installed for their operating hours using run time meters.*

The operating hours of a selected sample of CFL are being monitored by a run time meter^{/13, 14 &15/}.

3. *In either case, monitoring shall include annual checks of a sample of non-metered systems to ensure that they are still operating (other evidence of continuing operation, such as on-going rental/lease payments could be a substitute).*

The annual check of a statistically valid number of samples of non-metered system to ensure that the CFL are still in operation was carried out by an independent third party^{/16/}.

4. *In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.*

For neglecting the leakage effect the independent third party has verified the number of scrapped bulbs and confirmed that the number of scrapped bulb is higher than the CFL distributed^{/12/}.

In summary the monitoring plan of registered PoA-DD and CPA-DD was found to be inline to the applied methodology AMS IIC version 09 and was also being followed on site.

3.4 Completeness of Monitoring

Monitoring of reductions in GHG emissions to result from the registered project have been implemented in accordance with POA-DD and CPA-DD. The monitoring mechanism is effective and reliable. The detailed verification conducted on site and closure of raised CAR and CL has been discussed below in details.

3.4.1. Parameters required to be monitored as per PoA-DD

a. Number of operational CFL, n_k ,

The number of CFL in operation, during the monitoring period, was a calculated number. The third party (Global Scan) collected the data, on the CFL, from 126 different households and in total 504 CFL was surveyed. The number of CFL in operation was calculated by adjusting the number with the proportion of the CFL operational during the monitoring period and figures comes out as 965,601. The third party report was cross checked and found to be appropriate. For further details on this parameter please refer 3.4.1 c, d & 3.4.2 g.

The third party Global Scan reported that 97.82% CFL were found in operation during the survey. The Global Scan report has been checked and found appropriate^{/16/}. 100% of the survey records, the data and the procedure adopted by Global Scan for selecting the sample on a simple random basis to arrive at the % of operational CFLs was checked by the Assessment Team from SGS. This was available at the CME office at Mexico City. These data were complete and representative of the entire population of the CPA and also met the requirement of 90/10 confidence/precision and thus accepted to be correct. . For more details on this parameter please refer section 3.4.2 g of the report. In addition, in order to crosscheck on the Global Scan survey used to arrive at the % of operational CFLs, the DOE, based on its professional expertise carried out an independent sample check selecting 100 households in the CPA using the simple random process. 150 households were selected out of which, 100 households were found to be participating in the CFL exchange program i.e. 400 CFLs being checked physically which was found to be more than the number of samples to be checked in the cross-check sample group (387 CFLs as per software available under EB 50 Annex 30 <http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online> and <http://www.freestatistics.info/stat.php>). The data collected was further evaluated by the assessment team to arrive at the % of operational CFLs and it was found to be at 98.7% This was found to be equivalent to the result from Global Scan and thus the procedure, survey records and the data provided by the Global Scan report was found to be appropriate. Please refer to section 3.7 on the procedure adopted by DOE on check of data at CME office and field survey throughout the state of Puebla.

b. Number of incandescent bulbs collected, n_i

The number all the incandescent bulbs collected/replaced by CFL were recorded every time the exchange was made. The data was noted down in the specialized programme (Data Management System) DMS All Exchanges excel sheet which was verified and found consistent^{/11/}. The number of incandescent bulbs operated in the baseline scenario (965,601) was also cross verified with the distributed CFL and number of CFL distributed (997,458) was found higher than the collected incandescent bulbs. However, these numbers, of CFL and incandescent bulbs, were adjusted conservatively before use in the emission reduction calculation. For emission reduction calculation, the PP undertook conservative approach and did not consider the 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. Further 17,803 number of CFLs were also not considered so as to ensure conservativeness in terms of capping the number of bulbs to 4 and thus, 954,706 bulbs were considered on conservative approach for emission reduction calculations.

c. The power of the incandescent bulbs “i” replaced, p_i , (W)

The wattage of received incandescent bulbs was recorded during the exchange programme. The operator, on receipt of the incandescent bulbs, feed in the wattage in the online software (DMS) and a consolidated sheets giving information on the number and rated power of the incandescent bulbs was generated^{/11/}. The weighted average of power has been calculated from the consolidated spread sheet and the figure came out as 74.59 W, which was revised as 74.39 W with revised number of CFLs as per ExchangeDMSReport.docx and Impact Data ILB wattage in DMS report v2 20110928.xls which was found to be conservative and consistent hence accepted . The original spread sheet (DMS data xls) has been verified by the assessment team and found in order. For more details on DMS, incandescent bulb's number and power recording mechanism please refer 3.4.2 a & h.

d. The weighted average power of the CFLs “k” distributed p_k , (W)

The weighted average power of the CFLs has been derived from the DMS which includes all the data (number and power) of the distributed CFL in the CFL exchange programme. The raw data was analysed and CFL of 15 W and 20 W was found as 59.80% and 40.20%, respectively. These figures were used to calculate the weighted average power of CFL which comes out as 17.01W. The original records (DMS all exchange) has been verified by the assessment team and found to be correct^{/11/}.

e. The average annual operating hours of CFLs “k” distributed, o_k , (hours/day)

This operating hours of the CFL are being measured by a device called Lean Radar and recorded continuously in the system logs^{13/}. The monitoring device records the energy consumption in W and the reported values (Wh) for consumption of electricity is calculated by multiplying the time with W^{13/}. The average annual operating hours of CFLs has been calculated and the value came as 3.234 hours/day, which was based on the available data of the over the range of number of days of 5 to 359 days. The data for this parameter was arrived at from the 240 samples of nPSG which were 100% checked at the CME office in Mexico City where the data is archived and 100% of the sample were physically checked for the 60 households during the verification site visit to check the operation of CFLs. It was noted here that in the case where any of the 240 samples were found to not be operating, the CME/ the PP would immediately replaced these. Details of the sample check on site and data check at Mexico office of CME are included in both sections below 3.4.2 and 3.7 below.

Completeness of Data for the period 01/12/2009 to 30/11/2010.

During the data verification, out of the group of 240 samples that were checked, the number of days of operation of the CFLs in the sample group was found to be in the range of 5 days to 359 days while the reported total number of days of monitoring was 365 days. The CME clarified that all the data available for the period was reported in the emission reduction excel sheet. The data missing in some of the CFLs was due to unexpected technical difficulties in individual pieces of monitoring equipment (Lean Radar) either measuring or transmitting the data at either bulb or household level. The range of technical difficulties that caused the missing data, as well as the process for treating missing data in the calculation of the average hours of use over the monitoring period, were contained in the document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0".

Further the CME clarified that neither the methodology (AMS II.C. version 09) nor the CPA-DD specifically requires all 240 bulbs to be monitored for 365 days and as such there was no procedure clearly available for the missing days. Complying with the monitoring plan, all 240 CFLs were monitored over the monitoring period, and were shown to be statistically representative and within required confidence levels, with the missing data occurring at random and without seasonal bias. In treating lost data, the most conservative approach theoretically possible was used. The CME clarified that by taking all the available data it attempted not to introduce any bias to the data calculations. The independent statistical expert at Melbourne University has reviewed the data and calculation methods used, and has confirmed via an independent letter sent to the CME dated 15/12/2010 (Statistical Consulting Centre, The University of Melbourne) and further by independent letter to the CME dated 22/09/2011 (Statistical Consulting Centre, The University of Melbourne) that the sampled data and calculation methods are sufficient and statistically valid to provide an accurate, reliable and unbiased representation of the average daily hours of use for the population, compliant within the requirements in the CPA- DD and the "General Guidelines For Sampling And Surveys For Small-Scale CDM Project Activities (Version 01)". It can be noted that during the validation of the project, the tool was not available.

However, referring to the paragraph 208(a) of VVM 1.2, the CME considered the theoretically most conservative approach which was available for the consideration of the monitoring of the 240 CFLs under the sampling plan. A conservative approach of considering 365 days of operation for all the 240 CFLs was adopted and the emission reduction calculation was revised. Based on the revision, the average hours of operation for the CFLs was 2.134 hours/day which was found to be conservative in terms of the actual number of days of operation and hence accepted.

The document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0" was checked and the data was found to be correctly reported. Further, the requirement of the methodology AMS II.C version 09 was checked and the requirement of the number of days of operation of the monitoring equipment was not found to be a required parameter. A selection from the 240 CFLs which were monitored were checked during the onsite evaluation. It was observed that out of this selection, data for all the 365 days was not available for the sample of 240CFLs. As such, to be on the theoretically most conservative approach, the CME undertook 365 days as average operation for all the 240 CFLs. This was found to be in line with the requirements as per paragraph 208 (a) of VVM (Version 01.2) and thus accepted.

Impact of Completeness of Data for the period 01/12/2009 to 30/11/2010 on 90/10 confidence/precision level and conservative approach with deviation.

Due to the conservative approach of using the average of 365 days of operation for the sample of 240 CFLs, the result showed the precision of the average operating hours of CFLs was greater than 10 i.e. the 90/10 confidence/precision criterion was not met.

In order to address the issue, CME adopted the conservative approach of considering the lower value of the interval (instead of mean value of operating hours). For a mean of 2.134 hours with precision of +/- 10.33%, the lower and upper values of interval are 1.914 hours and 2.355 hours respectively. The available range of the operating hours available based on the conservative approach of 365 days is at 1.914 hours and 2.355 hours. Based on this range, the earlier approach which was considered was to apply the mean of 2.134 hours, however, considering the range, a conservative approach would be to consider 1.914 hours. Since this is the lower range being considered as per the provisions of VVM para 208(a) this can be considered as theoretically most conservative approach. Thus at a confidence interval of 90%, for the lower value of the interval there is a 5% chance that the true operating hours are below this figure. This was checked and found to be a conservative approach considering the fact that the monitoring plan of the POA-DD / CPA-DD does not cover the aspect of non compliance with the level of precision level. Further, during the validation of the project, the General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities (Version 01) was not available and thus applying the lower value of the interval is more conservative as there is only a 5% chance that the true operating hours are below this value of 1.914 hours. Therefore, the CME proposes to apply the lower value of the interval i.e. 1.914 hours for emission reduction calculation, which was conservative which was found to be acceptable. Based on the above approach, the precision level was deviated from the provisions of the project and thus CME requested a deviation for the period from 01/12/2009 to 30/11/2010 to UNFCCC. The request for deviation was approved by the UN EB on 24/07/2012.

With the conservative approach of considering the data for the 240 samples in line with para 208(a) of VVM 1.2 in addressing the number of days of operation as 365 and also considering the lower limit of the interval of operation i.e, 1.914 hours, the CME has considered this conservative approach on both the completeness of data and also on the precision level and thus it was not necessary for a revision of the monitoring plan for the current monitoring period (01/12/2009 to 30/11/2010). Further, it was checked and found that there has been no such change in the project design in terms of the project equipment details like CFL specification etc due to this deviation from the provisions mentioned in the POA-DD or the CPA-DD document. This approach was found to be consistent with the approval of I-DEV-POA-0476 ^{/35/} received on 24/07/2012 and hence accepted.

The data collected spread sheet, data collection methods was cross checked on site and found to be correct. The procedures adopted for the monitoring of operation hours has been detailed in great length in section 2.2.2 e of this report.

f. CFL Collection and recycling scheme

This parameter is discussed under section 3.4.2 k of this report.

g. Number of project activity devices (CFL) distributed by the CPA coordinating entity, L_k

The numbers of CFL distributed, in the programme, are recorded in the DMS during the exchange of incandescent bulbs. The DMS records were checked for the final number of CFL and found okay^{/11/}. The same number of CFL distributed was also cross checked with the collected incandescent bulbs and found in order. The actual number of CFL distributed (997,458) has been adjusted, to eliminate the chances of error, on a conservative basis and a revised number (987,146) were used for the ER calculation (please refer CL#02). Further for emission reduction calculation, the PP undertook conservative approach and did not consider the 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. Further 17,803 number of CFLs were also not considered so as to ensure conservativeness in terms of capping the number of bulbs to 4 and thus, 954,706 bulbs were considered on conservative approach for emission reduction calculations which was found to be consistent approach and hence accepted. For further details on this parameter please refer section 3.4.2 b.

h. Total sample size used for monitoring utilisation hours/electricity consumption of CFLs (n_{PSG})

For the monitoring of operational hours and electricity consumption 240 CFL has been make equipped with the monitoring devices. The calculated number of the CFL for the monitoring was found the correct representation of the distributed number of CFL in the programme. The SGS verification assessment team has also cross checked the installation and operation of the monitoring device during site visit and found them acceptable. Section 3.2.2 e,f and 3.7.1 can also be referred for further details on the monitoring procedures and the efforts on site from the SGS verification assessment team.

i Total sample size of CFLs used for checking to ensure ongoing operation of project devices (n_{PCCG})

The coordinating entity has hired a third party (Global Scan) for the data collection of ongoing operation of the project devices in this monitoring period. The number of CFL surveyed by the third party is 504 and the collected data has been extrapolated inline to the emission reduction calculation expressions of the CPA-DD. Parameter number 3.4.2.g can be referred for more details. Please refer to section 3.7 on the procedure adopted by SGS on check of data at CME office in Mexico city and sample physical verification at site.

3.4.2 Parameters required to be monitored by CPA-DD

a. Collection of Incandescent Name plate Data

The number and rated power of all the incandescent bulbs exchanged by CFL have been recorded every time the exchange was made at the distribution centres. There are number of distribution centres operated and there may be one or more stands at each centre during the distribution of the CFL. The coordinating entity has announced the dates and the places for the exchange in much advance for the corresponding localities of the Puebla state in Mexico. This announcement and campaign has been cross verified by the photographic evidences (billboards at bus stops etc.)^{17/} and also by interviewing the local personnel who has exchanged the incandescent bulbs^{18/}. The exchange was made throughout a month and any day the incandescent bulbs can be exchanged with CFL. The distribution centres (Coppel and Comex outlets) wherein the exchange was made had a separate stand and a trained person to carry out the exchange activity. This person (operator) recorded the data online in the Data Management System (DMS) every time the exchange took place. It was announced that every household should come to the outlet, for exchanging bulbs, with their electricity bills and the live incandescent bulbs for the replacement with CFL. Whenever, any household owner came up to replace the incandescent bulbs, the operator filled in the information about the number of bulbs and rated power capacity by physically viewing them, on the server directly. Every operator was equipped with the laptop connected to the internet.

The utility bill has a unique number so any overlap in the households will be picked up by the DMS immediately since all the stands computers are connected online with the server^{11/}. This measure (keeping all laptops on server) was implemented to avoid any duplication of utilities bills (to have more CFL) by household owners. Every stand has a tester to check whether or not the ordinary bulbs are live since only live bulbs can be replaced. The data from the laptop used at the outlet go to the server and all the data are stored therein. There is no manual transfer in the data. Whenever a person updates the information about the number of the incandescent bulbs received and to be replaced and the rated capacity, the DMS automatically displays the capacity and the number of the CFL to be given to the corresponding household. No calibration is required for the DMS since it's just a data archiving software and not a monitoring/measurement device. The Electricity Utility Bills and the bulbs were verified on site while exchanging the bulbs. This data was collected and the same was noted down in the Customer Database excel spread sheet and the same is saved in the name of DMS All Exchanges excel sheet. The Column I of the excel sheet refers to the utility bill reference number. Further, the first name and last name of the owner has been noted. Also, the spreadsheet gives the detailed information on the number of bulbs exchanged and also on the number of households.

The data was collected manually so calibration requirements are not applicable here. The exchange program was done during October 31st, 2009 to November 31st, 2009. The incandescent bulbs were exchanged every single day at different outlets of Coppel was covering Puebla State and Comex for the municipalities of the Puebla city. During these days the household owners, exchanged the bulbs showing the utility bills and the old incandescent lamps were taken back from them. Anything under 60W and 60W incandescent, the replaced CFLs were of 15W (actual power but labelled as 14W, please refer CAR#01) and above 60W incandescent, the CFLs were of 20W (actual power but labelled as 18W, please refer CAR#01).

The output is the number and rated capacity of the CFL distributed and measured by this software. The information is being uploaded, at the time of CFL distribution, manually and automatically recorded on the server^{/11/}.

b Collection of the CFL name plate data

The number and power rating of all the CFL distributed have been recorded every time exchange was made. The coordinating entity had the number of distribution centres and there were one or more stands at each centre. The announcement for the bulb replacement was made much in advance^{/17/}. During any day of the selected month the incandescent bulbs can be exchanged with the relevant CFLs. The place like shops wherein the exchange will be made had a stall and a trained person who recorded the data online in the DMS. Every household owner should come to the outlet with the electricity bills and the ordinary bulbs to replace them. Whenever the household owner comes to replace the incandescent bulbs the operator fills in the information about the incandescent bulb on the DMS and the DMS will automatically give him the instruction about the number and rated capacity (W) of CFL to be given the household owner. The operator will give the CFL number and capacity corresponding to the incandescent bulb received and the information will automatically upload in the DMS. The DMS software was made by Impact Data Company from Melbourne which has been designed for the purpose of the monitoring of this project only^{/19/}.

The distributed CFL can be double checked with the received incandescent bulbs^{/11/}. The number of incandescent bulbs was also verified by a third party so the report was used to cross check the number of CFL distributed^{/12/}.

c. Check that CFL and Incandescent bulbs correspond

No monitoring device is used for the monitoring of this parameter and this is just a comparison/cross check for two monitored values. During the exchange of bulbs, the actual number of exchanged recorded in DMS as 997,458 however this number was adjusted for errors and more realistic final number for the distributed CFL came as 987, 146^{/11/}.

The number for the scrapped incandescent bulbs has been reported by third party as 995, 891. The reason for this mismatch has been discussed in the form of CL#02 in section 3.2.2d of the report. The numbers of scrapped incandescent bulbs were checked from the report issued by third party independent verifier^{/12/} and found to be okay. In theory, the number of incandescent bulb received should be equal to the CFL distributed but given the size of the exchange it doesn't look possible to match this number. Following the CPA-DD, the conservative number (987,146), out of distributed CFL and scrapped incandescent bulb, were considered for ER calculation. Further for emission reduction calculation, the PP undertook conservative approach and did not consider the 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. Further 17,803 numbers of CFLs were also not considered so as to ensure conservativeness in terms of capping the number of bulbs to 4 and thus, 954,706 bulbs were considered on conservative approach for emission reduction calculations which was found to be correctly applied and hence accepted.

d. Independent check of scrapped incandescent bulbs

EnviroSense SA de CV compiled the independent report (Feb, 2010) for the PP^{/12/}. This company also made a physical spot check at the CFL distribution centre. The page 6 of the report by EnviroSense SA de CV confirmed that the inspection of the data, to ensure the number of CFL distributed along with the number of incandescent bulb collected, was carried out by the company. However, there was a difference observed in CFL and incandescent bulbs but as per the CPA-DD lesser number of CFL (987,146) was used for the ER calculation, which is further revised as 954,706 after the UN request for review and this has been discussed in CL#02 below. The page 13 of the EnviroSense report talks about the physical verification of the incandescent bulb before their destruction and page 15 mentions the schedule of the delivery of the incandescent bulbs before the destruction. The report was cross verified with DMS records and found to be satisfactory^{/12/}. This parameter was monitored by the third party and the following requirement set in the PoA-DD was found to be met.

- a) At least one physical spot check at a randomly selected retail store during the CFL distribution process to ensure that exchange procedures are being followed- EnviroSense SA de CV report on page 5/6 mentions the information on the store visited by the third party.

- b) On completion of the distribution process the independent verifier will conduct an inspection of the project database to ensure that electronic records have been correctly entered and that the number of CFLs distributed corresponds with the number of incandescent bulbs collected.

The report issued by third party page 16 confirms that the requirement has been met.

- c) A physical spot check will be conducted of incandescent bulbs prior to their destruction in order to satisfy the independent verifier that collection has been undertaken correctly. This check will not include counting of incandescent bulbs, as this is not realistic given the large number of incandescent bulbs being scrapped.

EnviroSense SA de CV report on page 14 mentions the information on the store visited by the third party

- d) The independent verifier will then be present while the scrapping of incandescent bulbs is undertaken to ensure that no leakage occurs. This has been covered on page 14 of the report by the verifier

It was observed that the number of collected incandescent bulbs were inconsistent among submitted independent report from EnviroSense SA de CV (number of bulbs: 995,891) and Exchange DMS Report dated 30/03/2010 (plant records, number of bulbs: 997,458) and ER calculation sheet, ex ante (990,000) and ER calculation ex-post (965,601). The **CL#02** was raised to clarify the inconsistency. In response, the following justification has been received and was found to be sufficient. It is observed from the third party report^{/12/} that the numbers of incandescent bulbs have been determined by the weighing the created waste by the bulbs and as such there was no manual counting of the bulbs (the adopted method is discussed in details in section 9 of this report: CL#02 of the report). The bulbs were transferred to the recycling plant in boxes that were transported on pallets in a number of shipments to the recycling plant. The bulbs, boxes and pallets were all destroyed and recycled together. The total estimated weight of pallets and boxes processed at the plant was subtracted from the total weight to be able to calculate the estimated number of bulbs processed. It's obvious that the selected method can lead to a difference in number and keeping this in mind the provisions has been made in the CPA-DD to consider the lower number.

The number of incandescent bulbs in DMS all exchanges report (997,458) is actually based on manual counting which was done during the replacements of the incandescent bulbs with CFLs. In theory the number of incandescent bulbs received should be equal to CFL distributed but given the size of distribution and nature of the project activity, practically it was difficult to match these two numbers (number of CFL distributed and incandescent bulb received) because of several issues like some cases the loss of records or no entering the records in DMS and system delicacy. The DMS all exchanges report^{/11/} captures/confirms such types of issues.

The number of incandescent bulbs was estimated as 990,000 prior to the exchange. It is equivalent to the total number of CFLs anticipated to be distributed during the exchange (1,000,000), multiplied by the number of CFLs anticipated to be operational during the monitoring period (99%).

The number of incandescent bulbs that was used in the calculation of emission reductions (965,601) is equivalent to the total number of CFLs distributed during the exchange (987,146) multiplied by the number of CFLs operational during the monitoring period (97.82%). The used number of bulbs for emission reduction calculation was checked and cross verified from records on site and third party reports^{/11,12,16/}

The PP clarified derivations for the 3 different figures for the number of collected incandescent bulbs listed above, as well as the actual number of incandescent bulbs used in the calculation of emission reductions, are calculated using differing means and are explained individually below.

Independent report from EnviroSense SA de CV (995,891) :

The number of incandescent bulbs verified as having been destroyed at the recycling plant is determined by the weight of waste created by the bulbs rather than counting individual bulbs. The bulbs were transferred to the recycling plant in boxes that were transported on pallets in a number of shipments to the recycling plant. The bulbs, boxes and pallets were all destroyed and recycled together.

The total estimated weight of pallets and boxes processed at the plant was subtracted from the total weight to be able to calculate the estimated number of bulbs processed (as shown in the table below). As the total weight of incandescent bulbs destroyed is over 38 tonnes, and an individual bulb weighs only 26 grams, and the weight of pallets and boxes must also be taken into account, there is understandably a slight discrepancy

between the number of bulbs calculated from the waste processed and the number recorded in the exchange.

Weight of pallet	15	kg
Bulb weight	0.026	kg
Empty box weight	0.125	kg

Shipment #	Total weight (kgs)	Total pallets	Total boxes	Average bulbs/box	Total bulbs
1	2,990	16	6,048	13	77,287
2	4,130	21	6,900	17	114,438
3	2,730	17	5,900	11	67,345
4	4,850	23	7,800	18	136,822
5	3,410	17	6,426	14	91,153
6	5,020	26	8,700	16	137,306
7	3,550	17	6,426	15	96,579
8	3,570	17	6,490	15	97,045
9	3,080	15	5,670	15	83,188
10	3,440	16	6,048	16	94,729
TOTAL					995,891

Exchange DMS Report (997,458)

The Exchange DMS Report (*ExchangeDMSReport.docx*), authored by the creator and host of the Customer Exchange database part of the Data Management System (DMS), calculates the total number of bulb exchanges, and therefore incandescent bulbs surrendered.

In principle, the number of exchanges recorded (997,458) in this report should equate to the number of incandescent bulbs exchanged. However, in reality a number of issues must be taken into account to obtain the actual number of incandescent bulbs exchanged: the removal of test exchanges, system duplicates, and lost or non-recorded exchanges in the DMS. The Exchange DMS Report provides further particulars on these types of issues.

The table below, taken from a spreadsheet with supporting calculations to the Exchange DMS Report (*Impact Data DMS Final numbers.xls*), shows how the number of exchanges recorded (997,458) is adjusted for these issues to achieve the number of exchanges (987,146) which is equal to the number of incandescent bulbs exchanged as used in the ex-post Emission Reduction (ER) calculations.

Total Recorded Exchanges (A)	997,458	Total exchanges recorded in the DMS
Total System Duplicates (B)	16,434	Real System Duplicates, not system errors (i.e. when someone pressed the "Submission" button on the DMS interface twice, and therefore the exchanges were captured twice)
Total Test Exchanges (B1)	1,607	Test exchanges captured after the Luz Verdecita (pilot) and before the Comex employee and Coppel Employee days
Total Real Exchanges (C) = (A-B-B1)	979,417	Total recorded exchanges after system duplicates (B) and tests (B1) are removed, therefore, "real recorded" exchanges
Unique Customers with no Exchange Recorded (D)	1,929	This amount of customers are included in (E) - 246,363

Total Test Customers (D1)	59	Customers used as a test but removed from the final Customer list (E)
Total Customers Recorded in DMS (E)	246,363	This is the total amount of customers recorded in the DMS either with 0 (as per above), 1, 2, 3, 4 or more exchanges.
Average Exchange/Customer (F) = C/(E-D)	4.0069	Average exchange per household. Because the value is bigger than 4 (by 0.0069) this means that some houses clearly received more than 4 CFLs. If we multiply 0.0069 * 246,363 houses = 1,699 CFLs given "extra".
Exchanges of Customers in DMS with no Exchanges recorded (G)	7,729	There are 1,929 households (D) that appear in the system but with no exchanges (zero exchanges). By applying the Average Exchange/Customer value (4.0064) we obtain 7,729 exchanges that "should" appear there but do not appear.
Estimated Actual Total Exchanges (H) = (C+G)	987,146	The very final number of Exchanges therefore is 979,417 (C) + 7,729 (G)

ER Calculation Sheet – ex-ante (990,000)

The number of 990,000 incandescent bulbs is an ex-ante calculation (prior to project implementation) and is based on the values contained in the CPA-DD. It was based on best estimates prior to the exchange, with the final number to be determined after the exchange. It is equivalent to the total number of CFLs anticipated to be distributed during the exchange (1,000,000), multiplied by the number of CFLs anticipated to be operational during the monitoring period (99%), as shown in the table on the following page. Note that the number of incandescent bulbs in the exchange is identical to the number of CFLs as it was a one-for-one exchange.

Monitored Variable	Description	Unit of measure	Value
L_k	Total CFLs Distributed	-	1,000,000
p	Proportion of CFLs operational during monitoring period	%	99.00%
$n_k = L_k \times p$	Number of CFLs operational during monitoring period	-	990,000
$n_i = n_k$	Number of corresponding ILBs operating in baseline scenario	-	990,000

ER Calculation Sheet – ex-post (965,601)

It is important to note that the number of incandescent that is used in the calculation of emission reductions (965,601) is actually different to the figures explained above. It is equivalent to the total number of CFLs distributed during the exchange (987,146) (derived from the Impact Data report (*ExchangeDMSReport.docx*) and based on data on the number of bulb exchanges in the Data Management System, after any inconsistencies within the database (duplicate or blank records etc.) have been allowed for) multiplied by the number of CFLs operational during the monitoring period (97.82%) from the Project Cross Check Group survey (*Global Scan Final Report Nov 2010.xls*), as shown in the table below. Note that the number of incandescent in the exchange is identical to the number of CFLs in the exchange as it was a one-for-one exchange.

Monitored Variable	Description	Unit of measure	Value
L_k	Total CFLs Distributed	-	987,146
p	Proportion of CFLs operational during monitoring period	%	97.82%
$n_k = L_k \times p$	Number of CFLs operational during monitoring period	-	965,601
$n_i = n_k$	Number of corresponding ILBs operating in baseline scenario	-	965,601

The number of CFLs distributed which was considered in the calculation of the emission reductions (987,146 CFLs) includes the extra CFLs given to some households (some households received more than 4 CFLs). The PP was requested to justify on this aspect

It was reported that there were 1,929 households that appears in the system but that have no exchange record. The number of CFLs distributed which is considered in the calculation of the emission reductions (987,146 CFLs) includes the hypothetical number (7,729 CFLs = 1,929 household \times 4.0064 CFLs/household) from these households with no exchange record. The PP was requested to clarify on this aspect as well.

In response, the PP clarified that after the exchange program in November 2009 was complete, the creator and host of the DMS, Impact Data, undertook an analysis and audit of the final database to highlight any duplicate records and other data problems; their findings are contained in a report (ExchangeDMSReport.docx).

For emission reduction calculation, the PP undertook conservative approach and did not consider the 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. Further 17,803 numbers of CFLs were also not considered so as to ensure conservativeness in terms of capping the number of bulbs to 4 and thus, 954,706 bulbs were considered on conservative approach for emission reduction calculations.

A conservative approach than that used by Impact Data in order to ensure a maximum of 4 exchanges can be verified per unique, identifiable customer was adopted.

The final revised value for the number of eligible exchanges (954,706) was calculated using a new query over the customer database (Impact Data ILB wattage in DMS report v2 20110928.xls) so that this number excludes test records, duplicates, exchanges without unique electricity bill identification number or address, and exchanges that could be considered to be above the limit of 4 per customer. The average wattage of baseline incandescent bulbs exchanged (74.39 Watts) had also been recalculated based on this reduced number of exchanges.

The "hypothetical" 7,729 CFLs assigned to customers in the database with no exchanges recorded, and used in the calculation of the emission reductions (987,146 CFLs), was based upon an assumption that these customers would have the same average number of exchanges as the rest of the customers in the database. As the Monitoring Plan does not define the basis on which the total number of exchanges will be calculated, it was originally determined that this was an acceptable approach in line with the formulae and method described in the Monitoring Plan.

However, upon review a more conservative and verifiable approach was adopted, and the total number of exchanges has been revised (down to 954,706) with "hypothetical" exchanges excluded, as well any exchanges that could be considered above the limit of 4 per customer or that could not be identified by the unique electricity bill identification number or address.

During the verification site visit the information on the advertisement for the CFL distribution was found to be limiting the replacement of 4 bulbs with 4 CFLs based on the electricity bill provided by the household. The photographic evidences of the lamp replacement were checked and found to be consistent hence accepted. Further it was checked during the site visit that the households have limited number of CFLs. The limit was

set as 4 and there were no such household which had more than 4 CFLs. A random survey beyond the project sample group was also carried out during the site visit which revealed that there has been no exchange of more than 4 CFLs. Also the online DMS exchange interface limited each customer to exchanging a total of 4 bulbs each (based on electricity bill ID number), regardless of how many exchange locations the customer attended over the campaign. This information was checked live in the central exchange database at the time of the exchange, and made it impossible for the exchange personnel to enter more than 4 exchanges per customer. Further, the document ExchangeDMSReport.docx was checked for such exchanges where more than 4 bulbs could have been replaced, a total number of 17,803 CFLs were found and the PP removed them from the total on a conservative approach. The ExchangeDMSReport.docx and Impact Data ILB wattage in DMS report v2 20110928.xls was checked and found to be covering the aspect of total exchanges which included the records of 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. During the initial check of the information, the additional exchanges were also considered in the total number of CFLs as such the total number was calculated as 987,146. However, with further evaluation it was found that there was a possible double counting involved in the cases which did not have household which had no records. Thus to have a conservative approach for the total number of CFLs, the exchanges of hypothetical 7,728 households were not considered in the revised approach of emission reduction calculation. Thus the final value which was adopted correctly and conservatively by the PP for the purpose of emission reduction calculation was verified as 954,706. This approach was checked and found to be conservative and consistent thus accepted. With the revised number of CFLs the average wattage of the baseline incandescent bulbs exchanged was revised to 74.39 Watts. This was checked and found to be consistent in the Monitoring Report version 05 and hence accepted. Thus **CL#02** was closed out.

e. Monitoring use of project device

The operational hours of CFL are being monitored by a Lean Radar measuring device installed at the selected households. The Lean Radar has been designed to monitor the operational hours and energy consumption of the CFL. In total 240 devices have been installed at different CFL (used by households) to monitor the data ^{/15/}. The collected data is extrapolated to all CFL distributed in this CPA for emission reduction calculation.

The name of the monitoring system is 'Lean Radar System' supplied by company LEAN RADAR (M.R) The Lean Radar Model Number is LRE SMART MULTIPUNTO 10-250. The system includes two components, the coordinator (1 in number) and sensor (4 in numbers). The sensor is installed just next to the CFL at the ceilings and monitors the data continuously for CFL operations. The Lean Radar System is numbered as 8 to 68 in the records (Lean Radar data xls) ^{/13/}. The sensors receive the data and send to the coordinator (extension of Lean Radar device) which is connected through the radio signals to the monitoring device. The coordinator receives the signals from the monitoring equipment and sends them to the server through internet. The coordinator is connected to the internet all the time and sends the information as soon as received however the data remains stored, in the coordinator, for two weeks. In the cases of emergencies like power failure or no internet connection, the recorded data for the day is automatically sent to the server after the connection is re-established. All this information was verified from the specification of the Lean Radar and also double checked in actual situation on the site and was found to be satisfactory ^{/14/}.

The time in hr: minute (00.00) format, is being measured. The device records the readings in every 90 seconds. It is important to note here that the least count of this meter is one minute and readings are displayed to the lowest value as minute. Therefore, if the first reading was taken at 09:12 hrs then next readings may appear as 09:13 or 09:14 depending upon the time last reading was taken ^{/13/}.

The device sends the data to the main server wherein it is being recorded and compiles in hours and finally summarized on weekly basis ^{/13/}. This weekly data is also being sent to central office (Australia) for further analysis, before it is being used for the ER calculation. The data is extracted by software and transferred into a daily sheet. Both the sheets have been compared and found to be in line and hence accepted. The daily sheets are being used for the emission reduction calculation.

The monitoring device monitors the energy consumption in W so the values for actual consumption are calculated by multiplying the time with W. The summary of the statistical analysis document name: CUIDEMOS Mexico CPA1 Monitoring Data Evaluation has been provided by the PP and has been found correct during verification. The analytical tools also being verified by the University of Melbourne by the

independent expert Sandy Clarke, Statistical Consulting Centre, University of Melbourne dated 15/12/2010. Data for every 90 seconds as reported in DMS and the average mean value of the same is calculated considered as 3.234 hours/day. During the data verification, out of 240 sample groups checked, the number of days of operation of the CFLs in the sample group was found to be in the range of 5 days to 359 days while the reported total number of days of monitoring was 365 days. The CME clarified that all the data available for the period was reported in the emission reduction excel sheet. The data missing in some of the CFLs was due to unexpected technical difficulties in individual pieces of monitoring equipment (Lean Radar) either measuring or transmitting the data at either bulb or household level. The range of technical difficulties that caused the missing data, as well as the process for treating missing data in the calculation of the average hours of use over the monitoring period, were contained in the document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0". **FAR #07** was thus raised at the time of request for review on issuance for the PP to revise the monitoring plan so as to include the procedure to be adopted for all such situation wherein the complete data for 365 days of the sample group of 240 CFLs would not be available.

Further the CME clarified that neither the methodology (AMS II.C. version 09) nor the CPA-DD specifically requires all 240 bulbs to be monitored for 365 days and as such there was no procedure clearly available for the missing days. Complying with the monitoring plan, all 240 CFLs were monitored over the monitoring period, and were shown to be statistically representative and within required confidence levels, with the missing data occurring at random and without seasonal bias. In treating lost data, the most conservative approach theoretically possible was used. The CME clarified that by taking all the available data it attempted not to introduce any bias to the data calculations. The independent statistical expert at Melbourne University has reviewed the data and calculation methods used, and has confirmed via an independent letter sent to the CME dated 15/12/2010 (Statistical Consulting Centre, The University of Melbourne) and further by independent letter to the CME dated 22/09/2011 (Statistical Consulting Centre, The University of Melbourne) that the sampled data and calculation methods are sufficient and statistically valid to provide an accurate, reliable and unbiased representation of the average daily hours of use for the population, compliant within the requirements in the CPA- DD and the "General Guidelines For Sampling And Surveys For Small-Scale CDM Project Activities (Version 01)". It can be noted that during the validation of the project, the tool was not available.

However, referring to the paragraph 208(a) of VVM 1.2, the CME considered the theoretically most conservative approach which was available for the consideration of the monitoring of the 240 CFLs under the sampling plan. A conservative approach of considering 365 days of operation for all the 240 CFLs was adopted and the emission reduction calculation was revised. Based on the revision, the average hours of operation for the CFLs was 2.134 hours/day which was found to be conservative in terms of the actual number of days of operation and hence accepted.

The document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0" was checked and the data was found to be correctly reported. Further, the requirement of the methodology AMS II.C version 09 was checked and the requirement of the number of days of operation of the monitoring equipment was not found to be a required parameter. A selection from the 240 CFLs which were monitored were checked during the onsite evaluation. It was observed that out of this selection, data for all the 365 days was not available for the sample of 240 CFLs. As such, to be on the theoretically most conservative approach, the CME undertook 365 days as average operation for all the 240 CFLs. This was found to be in line with the requirements as per paragraph 208 (a) of VVM (Version 01.2) and thus accepted.

Due to the conservative approach of using the average of 365 days of operation for the sample of 240 CFLs, the result showed the precision of the average operating hours of CFLs was greater than 10 i.e. the 90/10 confidence/precision criterion was not met. This resulted in the rejection of the project during issuance request post request for review.

Post rejection, in order to address the issue, CME adopted the conservative approach of considering the lower value of the interval (instead of mean value of operating hours). For a mean of 2.134 hours with precision of +/- 10.33%, the lower and upper values of interval are 1.914 hours and 2.355 hours respectively. The available range of the operating hours available based on the conservative approach of 365 days is at 1.914 hours and 2.355 hours. Based on this range, the earlier approach which was considered was to apply the mean of 2.134 hours, however, considering the range, a conservative approach would be to consider 1.914 hours. Since this is the lower range being considered as per the provisions of VVM para 208(a) this can be considered as theoretically most conservative approach. Thus at a confidence interval of 90%, for the lower value of the interval there is a 5% chance that the true operating hours are below this figure. This was

checked and found to be a conservative approach considering the fact that the monitoring plan of the POA-DD / CPA-DD does not cover the aspect of non compliance with the level of precision level. Further, during the validation of the project, the General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities (Version 01) was not available and thus applying the lower value of the interval is more conservative as there is only a 5% chance that the true operating hours are below this value of 1.914 hours. Therefore, the CME proposes to apply the lower value of the interval i.e. 1.914 hours for emission reduction calculation, which is conservative which was found to be acceptable. Based on the above approach, the precision level was deviated from the provisions of the project and thus CME requested a deviation for the period from 01/12/2009 to 30/11/2010 which was approved on 24/07/2012.

Further the CME applied for a revision of monitoring period which would be applicable for the POA from 01/09/2012. This request was approved by EB on 15/07/2012

Based on the approval of I-DEV-POA-0476 on 24/07/2012 and RMP on 15/07/2012, **FAR#07** was changed to **CAR#07** and the CME was requested to provide information how the project was meeting the requirements as laid down in the approved deviation I-DEV-POA-0476^{/35/}

CME clarified that with the conservative approach of considering the data for the 240 samples in line with the para 208(a) of VVM 1.2 in addressing the number of days of operation as 365 and also considering the lower limit of the interval of operation i.e, 1.914 hours, the CME has considered this conservative approach on both the completeness of data and also on the precision level and thus it was not necessary for a revision of the monitoring plan for the current monitoring period (01/12/2009 to 30/11/2010). Further, it was checked and found that there has been no such change in the project design in terms of the project equipment details like CFL specification etc due to this deviation from the provisions mentioned in the POA-DD or CPA-DD document.

This approach was found to be consistent with the approval of I-DEV-POA-0476^{/35/} received on 24/07/2012 and hence accepted.

The excel sheet provided was not complete as there are some missing values in number of spread sheets (e.g. "Work sheet Tab 4 has some missing data"). It was the compatibility of Excel .xls and .xlsx which had created the problem and when one works on the 2007/2010 version of MS Excel and while editing the file there would be no error shown. When one saves the worksheet in 2007 converted to 2003 format there is error on incompatibility. Thus, the file when viewed on 2007 platforms are back on compatibility mode and do not show an error as compared to the system which works on 2003 platform and thus having an error or has "missing data in Tab 4". So every time one would try to save it would be showing an error on compatibility and would result in error or missing data when the file is opened in MS Excel 2003 platform. Two excel sheet are provided now with one having links of Tab 4 and PSG data sheet and the other one having direct data (typed values) from the PSG data without the formulae which was checked and found to be consistent and without error. The two excel sheets ER_calculations_MP1_Dec09-Nov10 v3_Values_Only and ER_calculations_MP1_Dec09-Nov10_v3 were checked and were found to be consistent and thus accepted and **CAR#07** was closed out.

f. Establishment of project Sample Group (n_{PSG})

A statistically representative sample, for the monitoring of the distributed CFL, has been designed during the validation of the CPA. The number of CFL to be monitored was calculated as 240 which statistically represents, with an error margin of 6.5% and 90% confidence interval, 1 million populations of the bulbs. It may be noted that actual number of CFL used for ER calculation are actually lesser (987,146 and further verified as 954,706 after requested for review by UN) than 1 million. The calculation method was checked and was found to be acceptable^{/20,21,26,30/}. Expert from UDLAP Consultores, the consulting arm of the Universidad de las Américas Puebla, has provided guidance to the PP on the design of the sampling regime implemented under the monitoring plan to select households to participate in the Project Sample Group^{/21/}. Department of Statistics from University of Melbourne has also provided expert advice on the analysis and use of monitoring data obtained from the Project Sample Group by the expert of university of Pubela Mexico. The PP has also used an specific software to analyse the data^{/22/}.

The established number of sample was also checked, by the assessment team, using the software recommended by EB 50 Annex 30 (<http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online> and <http://www.freestatistics.info/stat.php> and the selected number was found to be consistent..

Further the selection of samples was not done using paragraph 27 of the most recent available Guideline for sampling and survey for CDM project activities and Programme of Activities (EB 69 Annex 4) as the DOE felt that the provision of doing a 100% check on all samples in terms of data would be more robust as samples selected in this way would be representative of the entire population of the CPA i.e. 1million. Nonetheless, this parameter and the calculated number have already been verified by the validating DOE (refer page 16 of CPA-DD) wherein no specific guideline or standard for sampling and survey was available to the CME/PP.

SGS has also referred the general guidelines for sampling and surveys for SSC project activities (EB50 Annex 30) and further on the EB 69 Annex 4 (21-27) and Annex 5 (Section V) and the selected samples were found to be consistent in terms of monitoring as per the registered CPA document and registered monitoring plan in the POA-DD. This was physically checked for all equipment during the on site assessment. Please refer to section 3.7 of this report on the details of Field survey and 100% data check at CME office at Mexico City by the assessment team on site..

g. Establishment of Project Cross Check Sample Size

This parameter is required to monitor the actual CFL in operation during the specific year. 126 households have been surveyed by the third party (Global Scan). The report prepared by the third party on the basis of the field survey was submitted on 21st November 2011^{/16/}. Just to cross verify the authenticity of the collected data by the third party, the assessment team has randomly asked some of the household owners, if they were interviewed by Global Scan (the company who did third party survey) about the operations of the CFL exchanged in the programme. The received feedback (address of the surveyed household) was compared with the list of household surveyed by Global Scan and found matching. The assessment team is in opinion that the third party survey is authentic and good enough to be extrapolated for the entire population of distributed bulbs in CPA.

The 'total sample size of CFL used for checking to ensure ongoing operation of CFL' has been calculated and validated as 240 in the CPA-DD (page 17). However, this number in the monitoring period was increased to 504 during the sample survey. As reported in the revised MR, it was transparent to the third party that the sampled number of CFL shall be at least 240 CFLs (which are non metered) and random. Therefore, in all probabilities the numbers of households were to be selected in a manner to reach this number (to meet a minimum of 240 CFLs) and were selected with specific assumptions by the third party (e.g. a certain percentage of households may not be accessible; a minimum CFL expected at each house etc.). It was the responsibility of the third party (who conducted the survey) to govern this sample survey and it was confirmed that the final CFLs survey indeed covered 504 CFLs, which was more than the minimum 240 CFLs required. It was accepted by the assessment team that increase in sample size was not mandated by the PP but rather random and independent of the PP; therefore the results are presented with statistically reduced error. This was found acceptable to the assessment team. This was found acceptable to the assessment team. The result of these samples was cross checked by the assessment team by randomly selected samples in different locations under the CPA beyond the 504 samples chosen by Global Scan. Details of this are included in section 3.7 of this report. Since the result of Global Scan survey and the SGS assessment team sample had less than 1% difference, hence the sampling, data collection procedure and the collected data were found to be appropriate and thus accepted.

It was also reviewed by the assessment team that once the results of 504 sampled CFLs were known to the PP there was no possibility to selectively identify 240 CFLs to meet the requirement of CPA-DD as that would have been bias. Therefore, it was found acceptable to the assessment team to accept the results as such. The sample has been collected from the 5 different cities of the states of Puebla. The number of sample collected, from different cities, varies corresponding to the number of CFL distributed in that neighbourhood. For example Puebla has got maximum number of CFL therefore the sample collected from this city is maximum (258 CFL), followed by Atlixco (118), San Martin (51), Chalchicomula (43) and Tehucan (34). The average of CFL, still in operation, has been extrapolated to the entire data and the adjusted data has been used for emission reduction calculation^{/5/}. Report by Global Scan was checked and found to be consistent and hence accepted^{/16/}.

h. Data Management System

A data management system (DMS) was developed by the coordinating entity which records the following data, as verified on site physically^{/11/},

- The list of the household owners with name and address
- Record of the incandescent bulb collected (number and rated power) surrendered by households
- Number and labelled capacities of the CFL distributed
- Type of monitoring equipment and data of installation
- Confirmation that each monitoring device and CFL are working (survey report)

This parameter is all about the management system and as such doesn't deal with any monitoring device.

j. Monitoring Period

This parameter mainly requires a cross check that the monitoring period should not exceed one year at one go. However, this report applies to first verification which is from 1st Dec 2009 to 30th Nov 2010 and therefore it has not exceeded one year.

It is also important to note here that the crediting period for the PoA initially started from 31st July, 2009 to 30th July 2016. Also, at the time of registration of the PoA, the date of the period of crediting period was also validated as 31st July, 2009 to 30th July 2016. However, following EB52 Report, Annex 59, the PP requested CDM EB to change the crediting period for the current CPA as 1st Dec 2009 to 30th Nov 2016, which is consistent with the CPA DD web link http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/832CYTQVBjDOHR0N5UPGFKX7641ASL/view.

k. CFL Collection & Recycling Scheme

The distribution of CFL was finished in December 09 and the CFL will be up and running for years. The PP has made and implemented the procedures for collection and recycling of CFL. The coordinating entity has established the means for the safe disposal of CFLs in Mexico. The task of creating such programs and infrastructure has been divided into five distinct areas: a) Awareness raising b) Establishing CFL return points; c) CFL collection logistics d) Safe disposal e) Mercury recycling. The particulars on progress in each of these areas since project implementation are contained in a report⁷⁷, establishing that procedures are in place that has been verified by the assessment team.

3.5 Accuracy of Equipment

In the PoA DD / CPA DD only one monitoring equipment i.e. Run Time Meter (Lean Radar Device) was used to measure the operational hours of the selected CFL. The meter continuously monitors the operation hours and sends the signals to the server..

The monitoring of CPA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla version 6 page 19 had stated that every household meter receives a routine re-calibration and maintenance check at least every three years. The CME was requested to clarify this in line with the requirement of the registered monitoring plan of the CPA which does not mention about the calibration of the equipment. Furthermore, the CME was to clarify the date of the calibration if any for the LEAN Radar equipments and if the calibration was not available clarify if hour meters have been calibrated and whether the calibration validity covers this monitoring period from 01/12/2009 to 30/11/2010.

Since the registered monitoring plan did not mention about the frequency of calibration of the LEAN Radar equipments which are used for the monitoring of the CFLs, thus in line with EB 61 Annex 21, in cases where neither the monitoring methodology, nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, the DOE shall ensure that the equipments are calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer specification, has been adopted by the PP which was found to be acceptable. The installation of the equipments were completed by the LEAN Radar supplier on 07/11/2009 which was checked with the installation completion letter to Cool nrg by Lean Radar Energy Solutions Center dated 07/11/2009 by Ing Luis Lopez Olivios, Director Administrative, Lean Radar Energy S. de R.L.^{14/}. Further, on 15/04/2010, the Hardware Technology Development Engineer, Lean Radar Energy S.de RL^{15/} declared that the calibration would be required every three year from the date of installation. The documents were checked and found to be consistent in terms of the calibration of the LEAN Radar equipment and the calibration was found to be valid until 06/11/2012 covering the current monitoring period from 01/12/2009 to 30/11/2010 and thus no calibration was required

during the monitoring period as the calibration of the equipment was available and valid for the entire period from 01/12/2009 to 30/11/2010 and thus accepted.

As no gap in calibration has been identified hence EB 52 Annex 60 has not been applied. Thus **CAR#08** was closed out.

3.6 Accuracy of Emission Reduction Calculations

The calculation of emission reductions is found to be correct. CARs/CLs have been raised and the response to CAR/CLs was found satisfactory and these were closed. The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'.

The number of CFL installed was adjusted with the third party report for verifying the percentage of operation of the sampled CFL, before use in the ER calculation^{/5/}. The average percentage of operated CFL has been extrapolated to the total number of CFL distributed. Similarly, the operational hours of the sample of CFL has been monitored and also extrapolated to the total number of CFL^{/5/}. The grid emission factor has been fixed in the PoA DD and same has been used for computing the final ER numbers^{/1, 2, 5/}. The sample calculation of baseline emissions and project emissions was found inline to the applied methodology and registered PoA-DD and CPA-DD.

Following VVM 1.2 guideline 178 (d) & 184, the PP was requested to provide all monitored data sets inline to PoA-DD and applied methodology and clarify how these requirement have been met especially for the operational hours of the CPF (parameter: monitoring use of project device), data used for calculating replaced ILBs in CPA under verification. **CL #03** was raised.

The PP provided justification and the documents supportive towards the precedence of the emission reductions. The precedence documents leading to the calculations of emission reductions were checked and found to be consistent and correctly adopted for the calculation. Further, the justifications and the approaches used by the PP in arriving at the emission reductions have been found to be consistent hence accepted. The requirement has been met especially for the operational hours of the CPF (parameter: monitoring use of project device), data used for calculating replaced ILBs in CPA. During the verification site visit the information on the advertisement for the CFL distribution was found to be limiting the replacement of 4 bulbs with 4 CFLs based on the electricity bill provided by the household. The photographic evidence of the lamp replacement was checked and found to be consistent and hence was accepted. Further it was checked during the site visit that the households have limited number of CFLs. The limit was set as 4 and there were no such household which had more than 4 CFLs. A random survey beyond the project sample group was also carried out during the site visit which revealed that there has been no exchange of more than 4 CFLs. Also the online DMS exchange interface limited each customer to exchanging a total of 4 bulbs each (based on electricity bill ID number), regardless of how many exchange locations the customer attended over the campaign. This information was checked live in the central exchange database at the time of the exchange, and made it impossible for the exchange personnel to enter more than 4 exchanges per customer. Further, the document ExchangeDMSReport.docx was checked for such exchanges were more than 4 bulbs could have been replaced, a total of 17,803 numbers of CFLs were found and the PP removed them from the total on a conservative approach. The ExchangeDMSReport.docx and Impact Data ILB wattage in DMS report v2 20110928.xls was checked and found to be covering the aspect of total exchanges which included the records of 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. During the initial check of the information, the additional exchanges were also considered in the total number of CFLs as such the total number was calculated as 987,146. However, with further evaluation it was found that there was a possible double counting involved in the cases which did not have household which had no records. Thus to have a conservative approach for the total number of CFLs, the exchanges of hypothetical 7,728 households were not considered in the revised approach of emission reduction calculation. Thus the final value which was adopted correctly and conservatively by the PP for the purpose of emission reduction calculation was verified as 954,706. This approach was checked and found to be conservative and consistent thus accepted. With the revised number of CFLs the average wattage of the baseline incandescent bulbs exchanged was revised to 74.39 Watts. This was checked and found to be consistent in the Monitoring Report version 05 and hence accepted. Hence, **CL #03** was closed out.

The ER, mentioned in the MR, for the monitoring under verification was found to be higher than the estimated in CPA-DD however following EB55 Annex 35, the claimed emission reductions have been capped by maximum estimated in the PDD for that year. Following VVM para 194 (c), the PP was requested to justify the reasons behind the difference between estimated emission reduction and actual achieved emission reduction. **CL #04** was raised in this regard.

It was analysed from the provided response from the PP and project documents that several factors, at the time of ex ante calculation, were underestimated or over-estimated nevertheless in actual implementation the some of the figures changed up to an extent and lead to higher ER numbers. For example, the average of ILB wattage, hours of use for CFL and proportion of distributed CFL under operation. Given the nature of the project, number of CFL to be distributed and huge sets of data handling, it is quite possible to have such variations in the values. The reasons given by the PP and the variations in the value were verified with the supportive documents and cross verified from the third party reports and onsite survey^{/11,12,13,16,18,24,25 & 27/}. Further with the conservative approach as per the requirement of the approved deviation I-DEV-POA-0476^{/35/}, the emission reduction was found to be lowered than the one which was estimated in the registered CPA and based on the approach which was found to be in line with the I-DEV-POA-0476^{/35/} the ER was found acceptable and **CL #04** was closed out satisfactorily.

3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed in section 3.4 above. All the data recorded is in compliance with the Monitoring Report.

Field survey and sampling methods adopted by SGS on site

SGS has not chosen any sampling method/procedures to select CPA for verification because at the moment there is only one CPA, under verification, that was registered. The assessment team conducted the extensive filed survey to cross verify the effectiveness of CFL distribution system, implementation of the monitoring devices, reliability of the data submitted by the PP and third party, and other related parameters. In order to collect the maximum possible data/information on site and archive this, a dedicated internal checklist (Field Survey Report)^{/27/} was drafted (Please refer to Annexure of this report in Section 12 for the format and sample field survey report of SGS). The checklist includes the following questions which needed to be answered, through the interview of household owners who exchanged bulbs, by the assessment audit team while visiting the household during the site visit.

1. Type of household surveyed (with monitoring device or without monitoring device)
2. Address of surveyed house
3. Number of CFL installed in the household (to be counted physically by the auditor)
4. Number of CFL in operation during site visit (just in case CFL is not live or broken)
5. Wattage of CFL installed (to cross check the data submitted by coordinating entity)
6. Date of damage/discard CFL (in cases any CFL is not working any more)
7. Treatment of discarded CFL (to overrule the possibility of it was re-sold)
8. Collected from Coppel and Comex (these two outlet distributed the CFL)
9. Date of distribution of CFL (to check the effectiveness of the distribution network)
10. Date of installation of CFL (to cross check if somebody got the CFL and hasn't installed it at all)
11. Is the monitoring device was found in operation during the visit (check if any the devices is faulty)
12. Installation position of the monitoring device in house (if monitoring device is connected to server)
13. Additional information if any (any thing additional observed on site related to CPA)
14. Household feedback for the operation hours of the CFLs (to cross check the third party reports on average operational hours of CFLs in the households of CPA)

The above field survey report was signed by every household owner who was participants under the CFL exchange program and was visited by the Assessment team members from SGS. The same document was signed and complied by the SGS team member who conducted the survey. Sample copies of the field survey report are enclosed as Annexure (Section 12) (of this document.

Given the large number of households in the CPA and in order to collect the large number samples, the assessment team was split into two separate groups, after few initial surveys by the entire team together. One team comprise the Sectoral Expert and Local Assessor and another team comprise the Lead Auditor and a bilingual to help the auditor to communicate with the household owners.

Before planning the site visit, the assessment team has analysed the appropriate sample size as a representative sample of the CPA and in doing so the guidance released in EB 50 Annex 30^{/30/} was considered as site visit was done in January 2011 when the guidance of EB 50 Annex 30 was available. The recommended free software in the guidance (EB 50, Annex 30-<http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online>^{/36/} and <http://www.freeststatistics.info/stat.php>^{/37/}) were used to calculate the minimum numbers of the CFLs to be surveyed. With the given number of distributed CFL (987,146), at least 240 sampled CFLs which were monitored with the Lean Radar equipments (nPSG) and 387 bulbs (keeping the error margin as 5% and 95% confidence) for random samples of nPCCG were to be sampled by the assessment team. In this analysis, the error margin has been considered as 5% on a conservative basis and this is one of the reason why this number (387) is higher than the number of CFL calculated (240) for the monitoring of operational hours in the CPA-DD.

It can be noted here that for parameter n_{PSG}, the number of samples were chosen during the validation and was validated as correctly chosen at the time of registration. Based on this, the CME/PP had randomly selected 240 samples where the units of LEAN Radar were installed for the monitoring of the parameter hours of operation (o_k). These samples were 100% physically checked by the DOE and no separate sampling plan for the parameter was prepared as the measuring equipments were installed only on these samples during the current monitoring period as per the provisions of the registered monitoring plan. Acceptance sampling as laid down in para 24 of EB 69 Annex 4 was not undertaken considering the fact that these 240 samples were representative of the entire population and a 100% check on the same would be robust. The data of all the 60 households i.e. 240 samples were 100% checked at the CME office at Mexico City based on which it was interpreted that the data was not complete for the 240 samples and were in the range of 5 to 359 days and thus the I-Dev-POA-0476 was requested to the CDM EB which was further approved. 100% of the data was further checked and found to be in line with I-Dev-POA-0476 and thus accepted.

For the sample group of n_{PCCG}, the assessment team checked the sampling approach, the sampling procedure and 100% of the complete data. This was done at the CME office at Mexico City where the information provided by Global Scan was available. It was found that the samples were selected by Global Scan on a simple random sampling basis and was further assessed to correctly arrive at the % of operational CFLs.

Further in order to cross check on the information provided by Global Scan, the assessment team chose to check random samples as per the calculations being arrived at by the use of independent software (<http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online>^{/36/} and <http://www.freeststatistics.info/stat.php>^{/37/}) as 387 samples.

The sample was calculated to be 387. In order to compensate any attrition, outliers or non response associated with the sample, the number of sample to be surveyed was increased to 400 bulbs. 100 households were randomly selected from the entire CPA and thus 100x4CFLs= 400 CFLs samples were checked by the DOE for information on operation of CFLs as per the format provided in Annexure 1. It was important to note that these 400 doesn't include the monitored household and random method of sampling was chosen in different livelihoods of Puebla State of Mexico. The field survey report (Annexure in Section 12) was used to collect the data and the obtained results were compared with the data sets given by the PP based on the independent sampling survey done by Global Scan^{/16/}. It was found that 98.7% samples were operational in case of the assessment done by SGS team which was comparable to the 97.82% operational CFLs as provided by Global Scan and thus the report of Global Scan was found to be accepted. Here also no acceptance sampling was undertaken by the DOE and the data collected by Global Scan was checked in 100% and further random sampling was independently done by the DOE as well to arrive at similar result to ensure robust cross check on the sampling which was representative of the entire population and also was meeting the 90/10 confidence/ precision level.

As mentioned, the above sampling was based on the available guideline of EB 50 Annex 30 at the time of verification site visit. However, considering the submission of the verification since EB 50 Annex 30 was no more valid a conformance with the provisions of most recent available Standard of EB 69 Annex 4 (para 21-27) and Guideline of EB 69 Annex 5 (Section V) to check for the requirement of any further sample check required prior to request for issuance for the data available for the period of 01/12/2009 to 30/11/2010.

Step wise analysis of EB 69 Annex 4 (STANDARD FOR SAMPLING AND SURVEYS FOR CDM PROJECT ACTIVITIES AND PROGRAMME OF ACTIVITIES version 3.0)

V. Sampling requirements for PoAs

Criteria Paragraph	Criteria	Justification
19.	This section covers specific sampling requirements for PoAs for application by a CME to estimate parameter values through sampling.	<p>For parameter nPSG, the CME/PP has considered 240 samples as per the initial estimations during validation which was found to be consistently being monitored with following number of samples in cities of Puebla State:</p> <ul style="list-style-type: none"> a) 120 CFLs (30 households) in Puebla city b) 20 CFLs (5 households) in Atlixco c) 4 CFLs (1 household) in each cities of Izucar, RdJuarez and Huachinango d) 24 CFLs (6 household) in Tehuacan e) 12 CFLs (3 households) in Zacatlan f) 28 CFLs (7 households) in Cd Serdan g) 8 CFLs (2 households) in San Martin h) 12 CFLs (3 households) in Teziutlan i) 12 CLFs (3 households) in Cholula <p>All these samples (100%) were physically checked and 100% data was verified by the DOE and thus the requirement was found to be met.</p> <p>100% data check was done for the parameter nPCCG which was provided by Global Scan, independently and over and above this in order to ensure robust cross check on the samples, DOE also selected random samples throughout the CPA to check and arrive at similar result as provided by Global Scan.</p>
20.	Parameter values shall be estimated by sampling in accordance with the requirements in the applied methodology separately and independently for each of the CPAs included in a PoA except when a single sampling plan covering a group of CPAs is undertaken applying 95/10 confidence/precision for the sample size calculation.	<p>The sample size in CPA1 was based on 95/6.5 confidence/ precision level which was validated at the time of registration. the above number of samples for PSG and PCCG as stipulated in the registered monitoring plan meets the required confidence/precision for CPA-1</p> <p>The above number of samples for nPSG and nPCCG met the requirement of 90/10 confidence/precision for CPA-1 Puebla and footnote 18 was not applicable as per the registered monitoring plan as the samples were considered only for one CPA and all CPAs were not taken together for sample collection. This was found to be as per the registered monitoring plan and thus accepted.</p> <p>However, it can be noted here that since 100% date for the entire 365 days for the 240 samples were not available hence the precision level of 10 was not met and thus I-Dev-POA-0476 was requested which was approved by UN.</p>

VI. Validation and verification of sampling plans of project activities and PoAs

Criteria Paragraph	Criteria	Justification
21.	<p>The proposed sampling plans shall be validated by DOEs²⁰ to determine whether they will provide parameter value estimates in an unbiased and reliable manner including determining:</p> <p>(a) Whether the proposed sample size and sampling method is adequate to achieve the minimum confidence/precision requirements. DOEs shall be able to reproduce the sample size calculation in order to validate the proposed sample size;</p> <p>(b) Whether the proposed sampling plan will ensure that samples are randomly selected and are representative of the population.</p>	<p>Going by the footnote 20 -Recommended evaluation criteria are included in “Guidelines for sampling and surveys for CDM project activities and programme of activities- Section V of EB 69 Annex 5 was referred and it was found that the criteria were to be fixed at the time of validation of the programme. Considering that the POA was registered in 2009 when the guideline of EB 69 Annex 5 was not available, the aspects were considered by the validating DOE and were covered under Section 4.7 of the Validation Report and accepted by CDM EB during the process of registration.</p> <p>The procedure adopted was found to be as per the requirement of registered monitoring plan and it was checked 100% in terms of the physical sample check and found to be consistent and thus accepted. The sampling method adopted by PP was adequate to achieve the minimum confidence / precision requirements and representative of the population and the DOE checked it 100% to ensure robust information in terms of implementation as per registered monitoring plan.</p>
22.	<p>DOEs shall verify whether the project proponents have implemented the sampling effort and surveys according to the validated sampling plans. The verification includes determining:(a) Whether the required confidence/precision has been met;</p> <p>(b) Whether the selected sample was representative of the population</p>	<p>During the course of verification the assessment team checked the implementation of the 240 samples as per the registered monitoring plan which was validated so as to meet</p> <p>a) 95/6.5 Confidence/ Precision level for the samples of n_{PSG} (240 as per registered monitoring plan) and n_{PCCG} (240 as per the registered monitoring plan) were met and thus accepted. The PP had calculated sample based on 95/6.5 Confidence/ Precision level during the initial calculation of number of samples at the time of validation. The DOE during verification has considered the 90/10 confidence/precision level to calculate the number of samples as per the guideline of EB 69 Annex 4.</p> <p>b) Selected sample of 240 for CPA-1 as per registered monitoring plan representative of 1 million CFLs in the state of Puebla (representative of the entire population).</p> <p>As the population size was very large hence the cross check on the formulae used for estimation of 240 samples at the time of validation was done and it was found to be correctly adopted as per the registered monitoring plan at 95/6.5 confidence/precision level and meeting the above requirements of representative of confidence/ precision of 90/10 and also was representative of the entire population of CPA. However, PP's sample record was checked and it was found to be not covering data for entire 365 days. FAR #07 was initially raised for this which was converted to CAR #07 following the approval of I-DEV-POA-0476 on 24/07/2012 and RMP on 15/07/2012. Please refer discussion on FAR#07 / CAR #07 above for details on this aspect. The approved RMP</p>

Criteria Paragraph	Criteria	Justification
		is not applicable for this period and only applicable for monitoring beyond the approval of RMP.
23.	As one means of validation/verification, a DOE may apply a sampling approach when the project proponents have not applied a sampling approach, provided that samples are randomly selected and are representative of the population	<p>For samples n_{PSG}, the provisions for check on separate samples other than the one monitored with the devices were not possible. Hence no separate sampling approach was applied during verification and 100% of 240 selected samples were checked physically and 100% data was also checked at the CME office at Mexico City where the archiving of the information from all the LEAN Radar Equipments were done.</p> <p>For samples n_{PCCG}, sample selection, procedure of sampling and data from the samples chosen by Global Scan (Independent Survey), were verified 100% by the Assessment Team along with which the assessment team undertook simple random sample as per the calculations being arrived at by the use of independent software (http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online^{/36/} and http://www.freeststatistics.info/stat.php^{/37/}) as 387 samples to cross check on the information provided by Global Scan. In order to compensate any attrition, outliers or non response associated with the sample, the number of sample to be surveyed was increased to 400 bulbs. It was important to note that these 400 doesn't include the monitored household and random method of sampling was chosen in different livelihoods of Puebla State of Mexico. The field survey report (Annexure in Section 12) has been used to collect the data and the obtained results were compared with the data sets given by the PP based on the independent sampling survey done by Global Scan^{/16/} and found to be correctly selected randomly and representative of the population.</p> <p>For parameter n_{PCCG}, random samples were selected by DOE during verification assessment and the data of the random sample (400 CFLs) were compared with the data provided by Global Scan (Independent surveyor who provided the information on n_{PCCG} group to the PP) and there were less than 1% difference in the information collected. The report of Global Scan mentions that the 97.82% CFLs were operative as compared to which the samples covered by the Assessment Team of SGS had 98.7% samples which were found to be operating.</p>
24	When a sampling approach is applied by the project proponents, the DOE may use acceptance sampling as described in below steps (paragraphs 25- 27 below) as part of validation ²¹ /verification activities to meet the requirements of paragraph 21 and 22 above: (a) Take a random sample of the PPs sample records; (b) Check – using own	In this case the DOE did not adopt the acceptance sampling as the numbers of 240 for n_{PSG} and 387 for n_{PCCG} were representative of the entire population and meeting the 95/6.5 confidence/ precision level as well as the 90/10 confidence/ precision level as per the requirement of guideline. Thus from the professional judgement of the DOE, it was found to be robust procedure in checking 100% data for both the sample groups at the CME office at Mexico. Also 100% physical check on the samples was found to be robust and appropriate than acceptance sampling for the n_{PSG} samples and thus all the LEAN Radar equipments along with the CFLs installed in 60 households under the CPA (State of Puebla) were checked for n_{PCCG} . Further to cross check the data and information provided by independent agency the DOE undertook simple random sampling of 400 CFLs to compare the % operational

Criteria Paragraph	Criteria	Justification
	<p>professional judgment – the acceptability (or otherwise) of the data for each record in the PPs sample records, and then;</p> <p>(c) Based on the number of records where there is agreement, determine if the PPs sample records meet the requirements</p>	<p>CFLs. This was also found to be more appropriate procedure than acceptance sampling.</p> <p>Accordingly the steps involved in 25-27 were not found to be necessary as the DOE had undertaken 100% check which was more robust in checking the representation of all the samples in terms of entire population and also meeting the 95/6.5 confidence/ precision as per registered monitoring plan and 90/10 confidence /precision level as per the requirement of the guideline. All discrepancy in completeness of sampling of nPSG was covered under FAR#07/ CAR#07 above</p>
25.	<p>In order to determine the size of the sample for field/onsite check, the DOE should specify in advance, using own professional judgment:</p> <p>(a) Acceptable quality level or the Level of Assurance, i.e. the proportion of discrepancies between the PP sample records and the DOE sample records (i.e. DOE field/onsite inspection results) that are acceptable, e.g. 1%;</p> <p>(b) The proportion of discrepancies between the PP sample record and DOE sample records that are unacceptable, e.g. 10%.</p>	<p>Since acceptance sampling was not done and 100% samples were checked on site by DOE hence the step is not required to be justified as per the requirement of para 24.</p>
26.	<p>The maximum errors associated with the determination indicated in paragraph 25 shall remain at levels indicated below:</p> <p>(a) A 5% chance that the DOE will wrongly reject the PPs records (i.e. reject a set of records of acceptable quality);²²</p> <p>(b) A 5% chance that the DOE will wrongly accept the PPs records (i.e. accept a set of records which is unacceptable).²³</p>	<p>Since acceptance sampling was not done and 100% samples were checked on site by DOE hence the step is not required to be justified as per the requirement of para 24.</p>

Criteria Paragraph	Criteria	Justification
27.	Using provisions under paragraphs 25 to 26 the DOE should determine: (a) n: the size of the sample; ²⁴ (b) c: the acceptance number. If the DOE observes greater than c discrepant records in the sample then the PPs set of records is not accepted. If the number of discrepant records is equal to or less than c then the PPs set of records is accepted.	Since acceptance sampling was not done and 100% samples were checked on site by DOE hence the step is not required to be justified as per the requirement of para 24.

Based on the above analysis the sampling choice and the selected sampling plan by the PP as well as during verification was found to be in line with the requirement of paragraph 21-27 of EB 69 Annex 4 and thus accepted.

It was noted that 100% of the samples were checked in terms of data and the process of data in flow was also checked to ensure that there is no difference in the approach by the PP or the approach of evaluation by SGS as DOE. This was to ensure that the samples were having an available data set to be representative of the entire population. As can be noted in the sampling, the Assessment Team ensured that 240 samples in the nPSG (monitored data) were 100% checked physically and also by data verification (with on-site check of 100% data archived for the period at the CME office located at Mexico City) and 100% check on all equipments involved in Sample were carried out during the assessment.. In the parameter of nPSG, there was no possibility of selecting any sample beyond the 240 CFLs as there would have been no monitoring equipments available in such scenario.

For samples n_{PCCG}, sample selection, procedure of sampling and data from the samples chosen by Global Scan (Independent Survey), were verified 100% by the Assessment Team along with which the assessment team undertook simple random sample as per the calculations being arrived at by the use of independent software (<http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online>^{36/} and <http://www.freestatistics.info/stat.php>^{37/}) as 387 samples to cross check on the information provided by Global Scan. In order to compensate any attrition, outliers or non response associated with the sample, the number of sample to be surveyed was increased to 400 bulbs. It was important to note that these 400 doesn't include the monitored household and random method of sampling was chosen in different livelihoods of Puebla State of Mexico. The field survey report (Annexure in Section 12) has been used to collect the data and the obtained results were compared with the data sets given by the PP based on the independent sampling survey done by Global Scan^{16/} and found to be correctly selected randomly and representative of the population.

For parameter n_{PCCG}, random samples were selected by DOE during verification assessment and the data of the random sample (400 CFLs) were cross-checked with the data provided by Global Scan (Independent surveyor who provided the information on n_{PCCG} group to the PP) and there were less than 1% difference in the information collected. The report of Global Scan mentions that the 97.82% CFLs were operative as compared to which the samples covered by the Assessment Team of SGS had 98.7% samples which were found to be operating.

Thus it was found in both the cases that the procedure adopted by selecting 100% samples were robust enough for SGS to conclude that the number of samples selected by the PP was demonstrative of the entire population and correctly implemented as per the registered monitoring plan. However, since 100% data was

not available for all the monitored sample of nPSG over the period of 365days I-Dev-POA-0476 was requested for the period which was approved by the UN. Please refer to discussion on this aspect in FAR#07 or CAR#07 above.

The SGS assessment team is in opinion, based in the conclusions made from the collected samples, that the data has been correctly interpreted and extrapolated, by the PP, for emission reduction calculations. The PP got the data analysed statistically and the used analytical tool has been verified by the third party (University of Melbourne)^{/26/} which was checked and found to be consistent and thus accepted that the calculations based on the samples were correct

3.8 Management System and Quality Assurance

The management system and control, internal audit procedures of the company were checked. In order to verify data quality, the Company involved in the project works in accordance with a quality assurance procedure (*Procedure for Coordinating Agency*), which establishes the operational and management structure implemented^{/28/}.

3.9 Data from External Sources

Emissions factor for electricity displaced from the grid relevant to the project boundary, EF, (kgCO₂/kWh)

Page 31 of PoA-DD mentions that 0.514 tCO₂/MWh will be used until the renewal of crediting period. The PP has not monitored this parameter and used the fixed value from the DD which has been checked and found to be consistent

The referred link 16, for EB55 Annex 35, in the MR page 23 was not found to be correct in the MR and hence the PP was required to check for consistency. **CL #05** was raised.

The PP provided the following references General Guidelines to SSC CDM methodologies, Version 14, EB55 Annex 35: http://cdm.unfccc.int/Reference/catalogue/document?doc_id=000002183

General Guidelines to SSC CDM methodologies, Version 15, EB58 Annex 23: http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf which were checked and found to be correct and hence **CL #05** was closed out.

4. Calculation of Emission Reductions

Parameter	Reported Value (as reported by pp in MR ver01)	Verified Value (as verified by DOE in MR ver07)
Number of project activity devices (CFL) distributed by the CPA coordinator, L_k	987,146	954,706
Proportion of CFL operational during monitoring period, P , (%)	97.82	97.82
Number of CFL operational, n_k , ($L_k \times P$)	965,626	933,869
Number of incandescent bulbs operating in baseline scenario, n_i	965,626	933,869
The weighted average power of the CFLs "k" operating during the monitoring period, as stored in the Data Management System, p_k , (W)	17.01	17.01
The weighted average power of the incandescent bulbs "i" replaced during the exchange process, p_i , (W)	74.59	74.39
The average annual operating hours of CFLs "k" distributed during the monitoring period as calculated by the monitoring devices installed in the PSG, o_k , (hours/day)	3.234	1.914
Emissions factor for electricity displaced from the grid relevant to the project boundary, EF , (kgCO ₂ /kWh)	0.514	0.514
Total sample size used for monitoring utilisation hours/electricity consumption of CFLs (n_{PSG})	240	240
Total sample size of CFLs used for checking to ensure ongoing operation of project devices (n_{PCCG})	504	504

The calculation method to be used for first verification

MP (monitoring period) = 365 days (01/12/2009 to 30/11/2010, both days included)

$$\begin{aligned}
 BE_y &= n_i \cdot p_i \cdot o_k \cdot EF \\
 BE_y &= 933869 \cdot 74.39 \text{ (W)} \cdot 1.914 \text{ (Hours/day)} \cdot 365 \text{ (days/year)} \cdot 0.514 \text{ (kgCO}_2\text{/kWh)} / 1000 \\
 &= 24,944 \text{ tCO}_2
 \end{aligned}$$

$$\begin{aligned}
 PE_y &= n_k \cdot p_k \cdot o_k \cdot EF \\
 PE_y &= 933869 \cdot 17.01 \text{ (W)} \cdot 1.914 \text{ (Hours/day)} \cdot 365 \text{ (days/year)} \cdot 0.514 \text{ (kgCO}_2\text{/kWh)} / 1000 \\
 &= 5,703 \text{ tCO}_2
 \end{aligned}$$

$$LE_y = 0 \text{ tCO}_2$$

$$\begin{aligned}
 ER_y &= (BE_y - PE_y) - LE_y \\
 ER_y &= 24,944 - 5,703 - 0 \\
 &= 19,241 \text{ tCO}_2e
 \end{aligned}$$

Certified Emission Reductions = 19,241 tCO₂

As per paragraph 3a) ii of the UNEB Guidelines to SSC CDM Methodologies (EB55 Report Annex 35), *If a project activity goes beyond the limit of its type in any year of the crediting period, the emission reduction that can be claimed by the project activity during this particular year will be capped by the maximum emission reduction estimated in the CDM-SSC-PDD by the project participant for that year during the crediting period:*

Also as per paragraph 1 of AMS II.C. v09: *The aggregate energy savings by a single project may not exceed the equivalent of 60GWh per year.*

Initially, the energy savings for the first Monitoring Period of one year was calculated as 65.6 GWh, which exceeded this limit. However, with the change in the average hours of operation of the CFLs, the revised value of energy savings was found to be within the limit as 37,434 GWh and hence no capping was required and the verified amount was found as 19,241 tCO₂e.

5. Recommendations for Changes in the Monitoring Plan

FAR #07 was raised initially for the PP to revise the monitoring plan so as to include the means/procedures to be adopted for all such situations where the complete data from the sample group of 240 CFLs is not available. The approach shall provide the conservative determination of emission reductions.

In response, the PP/CME applied for revision of monitoring plan for the project with random sampling and covering the entire population of the POA meeting the 90/10 confidence/precision level. The RMP was approved by the UN on 15/07/2012. Thus FAR #07 was revised as CAR#07 during this evaluation and CAR#07 was subsequently closed based on the provision of the revised MR as per the approved deviation I-DEV-POA-476.^{135/}

6. Overview of Results

Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

Yes. All members of the assessment team visited the sites and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.

The results of the site visits are recorded in the verification checklist which is used as an internal report only.

The evidence has been checked and collected. The revised monitoring report is attached with this verification report.

Has data from additional sources been used? If yes, please detail the source and significance.

Page 31 of PoA-DD mentions that 0.514 tCO₂/MWh will be used until the renewal of crediting period. PP has not monitored this parameter and used the fixed value from the DD.

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

Yes, please refer section 5 of this report.

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 27,665 tCO₂e for the period 01/12/2009 to 30/11/2010 as per the estimation made in the registered PoA DD/CPA DD. The actual emission reduction is claimed as 19,241tCO₂e

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

No such inconsistency was witnessed. CAR#01 was raised on this point but closed out satisfactorily after taking note of the information received from supplier and also from UNFCCC, on this matter.

Post monitoring report on UNFCCC website

For the CPA entitled 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla' Monitoring report is yet not publically available on the UNFCCC website because the interface for the PoA MR uploading is currently under development. However, the report was sent to the UNFCCC team by SGS on 5th January, 2011 and the UNFCCC team confirmed that it considered it as published from 06/01/2011. SGS has received the email from the UNFCCC (registration and issuance team on 06th Jan, 2011) confirming that the relevant DNA has also been informed about the issue.

UNFCCC Reference Number PoA 2535 & CPA 2535-0001 on UNFCCC website

http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/17BH6AJX524TYQUZF8KGCWV3OIPSE9/view

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by Cool nrg Carbon Investments Pty Ltd to perform the first verification of the emission reductions reported for the CDM POA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico)-Smart Use of Energy Mexico' and CPA 'CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) Puebla' UN 2535-0001 in the period 01/12/2009 - 30/11/2010.

The verification is based on the validated and registered project design document and the Monitoring Report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Monitoring Report version 07 dated 11/10/2012

The management of Cool nrg Carbon Investments Pty Ltd is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 07 dated 11/10/2012. Calculation and determination of GHG emission reductions from the project is the responsibility of the coordinating entity of the CPA CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico)-Puebla. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/12/2009 – 30/11/2010 based on the reported emission reductions in the Monitoring Report 07 dated 11/10/2012 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	PoA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico CPA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico)- Puebla
UNFCCC Reference Number:	PoA: 2535 CPA: 2535-0001
Registered PDD and Approved Used for Verification:	PoA-DD dated 22 nd July, 2009 CPA-DD dated 22 nd July, 2009
Methodology Used for Verification:	AMS II.C version 09
Applicable Period:	01/12/2009 – 30/11/2010
Total GHG Emission Reductions Verified:	19,241tCO ₂ e

Signed on behalf of the Verification Body by Authorized Signatory



Signature:

Name: Siddharth Yadav

Date: 09/11/2012

8. Document References

/1/	Registered PoA-DD, dated 22 nd July, 2009
/2/	Registered CPA-DD, dated 22 nd July, 2009
/3/	Letter from PHILIPS confirming the start and end date of distribution dated 04 th December 2009
/4/	Distribution Schedule (dates and place) by Cool nrg
/5/	Spread sheet for ER calculation
/5a/	ER calculation sheet version 02 ER calculation sheet version 03 ER calculation sheet version 03 with direct value on Tab 4
/6/	Monitoring report Version 01 (04/01/2011), Version 02 (dated 02/03/2011) and version 03 (dated 16/05/2011) - Difference between ver01 and ver02 was mainly the editorial like correction in the title of CPA on page 1. Difference between version 02 and version 03 are for the following points; Mentioning the number of CPA, correction in the EBLy number and ER number and explanation for increasing the sample size of CFL from 240 to 504 (nPCCG); version 04 dated 28/09/2011 considering the value of CFLs corrected as per the CL#02 and CL#03. Version 05 dated 14/10/2011 with conservative approach for number of days being considered and emission reduction being rounded down. Version 06 dated 26/07/2012 based on the approval of I-DEV-POA-476. Version 07 dated 11/10/2012 based on details of calibration of Lean Radar.
/7/	CFL collection and recycling report Nov10.docx
/8/	a) World Bank GEF Post-Implementation Impact Assessment (2006). <i>Mexico Ilumex Project</i> b) World Bank Appraisal of GEF Ilumex Project c) Independent Review of GEF and non GEF Efficient Lighting Projects
/9/	Validation reports (PoA: revision 02 dated 30 th July, 09 and CPA version 02 dated 30 th July, 09)
/10/	AMS II C version 09
/11/	DMS all exchanges xls. (consolidated data sheet for all records in the software)
/12/	EnviroSense SA de CV report on collection and recycle dated Feb,10
/13/	Lean Radar data.xls
/14/	Lean Radar specifications & letter for calibration requirements from Lean Radar Energy Solutions Center dated 07/11/2009 by Ing Luis Lopez Olivos, Director Administrative, Lean Radar Energy S. de R.L
/15/	Lean Radar invoice of installation by the third party and the Hardware Technology Development Engineer, Lean Radar Energy S.de RL dated 15/04/2010
/16/	(a) Global Scan survey report dated 21 st Nov, 2011 (All details with regard to choice and selection of sample, data collected from samples and procedure for collection of data) (b) Annex 8 - CUIDEMOS Mexico_Selection of Sample Groups (c) Sample Group Size for CPA1 (d) Cálculo de margen de error - UDLA ENGLISH
/17/	Photographic evidences submitted by the coordinating entity for distribution from Coppel and Comex
/18/	On site interview of the local households, exchanged the incandescent bulb with CFL for sample group nPCCG
/19/	Impact data Service Level Agreement
/20/	Summary sheet for statistical analysis (Statistics Calculator.xls)
/21/	Report by ULAP Consultores (Muestreo coolenergy - PSG Final Selection.doc
/22/	The R Project for Statistical Computing http://www.r-project.org/
/23/	CUIDEMOS Mexico CPA 1 Data Management + Quality Assurance Procedures.doc
/24/	Exchange DMS Report dated 30/03/2010
/25/	CUIDEMOS Mexico CPA1 Monitoring Data Evaluation
/26/	Analytical tools also being verified by the University of Melbourne by the independent expert Sandy Clarke, Statistical Consulting Centre, University of Melbourne dated 15/12/2010.
/27/	SGS Field Survey Report –CDM VER0993 POA

/28/	Procedures for Coordinating agency (Cool nrg)
/29/	International Electro-Technical Commission Standard 60969
/30/	General guidelines for sampling and surveys for small-scale CDM project activities: EB 50 Annex30
/31/	VVM Version 1.2 dated 30/07/2010
/32/	Impact Data ILB wattage in DMS report v2 20110928.xls
/33/	Independent letter to the PP dated 22/09/2011 by University of Melbourne
/34/	Approval of RMP by CDM EB on 16/07/2012
/35/	Approval of I-Dev-POA-476 dated 24/07/2012 by UN EB.
/36/	Sampling calculation website: http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online
/37/	Sampling calculation website http://www.freeststatistics.info/stat.php
/38/	General guidelines for sampling and surveys for small-scale CDM project activities and Programme of Activities- EB 69 Annex 5
/39/	Standard for sampling and surveys for small-scale CDM project activities and Programme of Activities- EB 69 Annex 4

9. Findings Overview

Findings Overview

	CARs	CLs	FARs
Total Number raised	03	05	0

Date:	27/01/2011	Raised by:	Assessment Team		
Type:	CAR	Number:	1	Reference:	AU4 1.1
Lead Assessor Comment:			Date: 27/01/2011		
SGS has spotted, during site visit, the power capacity of the distributed and CFL is not inline to POA-DD. Following the POA-DD page 6 the project technology should distribute the CFL of power capacity as 15W and 20W but during implementation the capacities of the CFL has been changed to 14 and 18MW. Please clarify why this change should not be considered a change in the project design and while doing so please refer VVM para 197.					
Project Participant Response:			Date: 04/02/2011		
Paragraph 197 of the VVM (version 1.2, Annex 1 of EB55) states: <i>If the DOE identifies that the implementation or operation of CDM project activity does not conform with the description contained in the registered PDD, the DOE shall conduct an assessment on the potential impacts due to these changes following the relevant guidelines established by the CDM Executive Board and based on this assessment, the DOE shall submit a notification or a request for approval of changes from the project activity as described in the registered PDD prior to the conclusion of the verification/certification for the corresponding monitoring period.</i>					
Referring to the paragraph above, the project proponents provide the following justification of the apparent change to the CFL power rating.					
a) The project was implemented in line with the PoA-DD and CPA-DD, with the exception of the CFLs distributed, which were labelled as 14W and 18W rather than 15W and 20W as in the project documentation.					
b) The PoA-DD and CPA-DDs stipulating that 15W and 20W CFLs would be distributed were completed and submitted for validation and registration prior to placing the final order for CFLs to be used in CPA 1. Based on the advice of the supplier of CFLs chosen for the project (Philips Lighting), the final products purchased and distributed were labelled as 14W and 18W CFLs, rather than the 15W and 20W CFLs described in the CPA-DD. The timeline for registration of the PoA was as follows: 6 April 2009: Requesting Registration 31 July 2009: Registration (CFLs stated in PoA-DD & CPA-DD as 15W / 20W) 17 August 2009: Purchase order for CFLs placed (CFLs stated in purchase order as 14W / 18W) It was at the time of the finalisation of the details of the bulb supply in the purchase order that the labelling of the wattage on the bulbs and packaging was altered. The purchase order to CFLs was placed with the supplier on the 17 th August, 2009 which is after the registration date for the PoA and CPA (31 st July, 2009). This purchase order (<i>Purchase Order Mexico Pilot English - PHL.xls</i>) has been provided to the DOE. The CFLs meet all required Mexican and international quality standards and are appropriate products for the purpose required under the CPA.					
c) The CFLs distributed under the CPA-DD in Puebla had been sold within Mexico by the supplier as 15W and 20W CFLs for 7 years. Given that the Puebla CDM Project was providing CFLs free of charge to consumers, in direct competition with normal retail outlets, supplier requested that the free and purchasable products be clearly differentiated. The IEC (International Electrotechnical Commission) standard IEC 60969 as the relevant international standard allows nameplate CFL wattages to be adjusted within a tolerance of 15%; this permitted the 15W to					

<p>be legitimately labelled as 14W and the 20W to likewise be labelled as 18W. The re-labelling of these products specifically for the Puebla CPA meets all International rules in relation to Wattage and in no way affects the bulb performance characteristics. The 14W/18W CFLs are exactly the same bulb, with identical performance, to the 15W/20W CFLs available for sale for the past 7 years in Mexico. A letter from the supplier, Philips Holdings Limited (<i>Philips letter wattage equivalence Mexico CFL.pdf</i>), confirming this request and the subsequent arrangements made, has been provided to the DOE.</p> <p>d) The changes required to the labelling of the CFLs for the CPA were not known to the Project Proponent prior to registration. As shown in the timeline in section b) above, the PoA had already been registered on 31st July 2009 when the order was finalised and placed on 17th August 2009.</p> <p>e) The change in CFL labelling from 15W and 20W to 14W and 18W is the only apparent change in project design affecting the operation/ability of the project to deliver emission reductions and as a result, the project still complies with the requirements of the SSC methodology AMS II.C. v9.</p> <p>Ability to deliver emission reductions: The project will still function in the same way as described in the CPA-DD. The altered wattages on the packaging of the CFLs distributed do not impact on their capacity to reduce energy consumption and deliver emission reductions as described in the CPA-DD and does not represent a material change to the operation of the project described in the CPA-DD.</p> <p>Guidance of the Executive Board: As per paragraph 10 (c) of Annex 66 EB 48, the project proponents believe that the change to the wattage of distributed CFLs compared to those described in the CPA-DD does not impact on the following aspects of the project:</p> <ul style="list-style-type: none"> (i) Additionality of the project activity – additionality of the project is not affected by the wattage of the CFLs distributed. There has been no impact on the barriers to the use of CFLs, and CERs remain the only revenue source for the project; (ii) Scale of the CDM project activity – the project remains a small-scale activity; (iii) Applicability and application of Approved Baseline Methodology under which the project has been registered – AMS II.C. v9 remains the applicable methodology and the application of the monitoring components of the methodology are not affected by the changed bulb wattages. <p>Based on this assessment, and that the CFL wattages stated in the PDD (15W and 20W) have been used in the ex-post Emission Reduction calculations, it is the view of the project proponents that the change to the wattage of distributed CFLs is not material with respect to the above issues, and is therefore not considered a “change to project design”.</p>	
Documentation Provided as Evidence by Project Participant:	
Purchase Order Mexico Pilot English - PHL.xls Philips letter wattage equivalence Mexico CFL.pdf IEC 60969-1.2.pdf (page 13)	
Information Verified by Lead Assessor:	
Purchase Order Mexico Pilot English - PHL.xls Philips letter wattage equivalence Mexico CFL.pdf IEC 60969-1.2.pdf (page 13)	
Reasoning for not Acceptance or Acceptance and Close Out:	
In accordance with the DOE's request with regard to para 2 of Annex 66 EB 48, the project proponents will revise all relevant sections of the PDD in due course to represent the actual CFL wattages (14W and 18W) used in CPA 1, and submit the revised documentation to the DOE so that guidance on the change can be sought from the EB on the acceptability of these changes. CAR #01 has been changed to FAR #01	
Acceptance and Close out by Lead Assessor: Open	Date: 09/02/2011

Date:	27/01/2011	Raised by:	Assessment Team											
Type:	CL	Number:	2	Reference:	AU4 Section 3. (1.4)									
Lead Assessor Comment:			Date: 27/01/2011											
In reference to the parameter ' <i>Independent check of scrapped incandescent bulbs</i> ' the number collected incandescent bulbs are inconsistent among submitted independent report from EnviroSense SA de CV (number of bulbs: 995,891), Exchange DMS Report dated 30/03/2010 (plant records, number of bulbs: 997,458) and ER calculation sheet (990,000). Please clarify on this.														
Project Participant Response:			Date: 04/02/2011											
The derivations for the 3 different figures for the number of collected incandescent bulbs listed above, as well as the actual number of incandescent bulbs used in the calculation of emission reductions, are calculated using differing means and are explained individually below.														
<u>Independent report from EnviroSense SA de CV (995,891)</u>														
The number of incandescent bulbs verified as having been destroyed at the recycling plant is determined by the weight of waste created by the bulbs rather than counting individual bulbs. The bulbs were transferred to the recycling plant in boxes that were transported on pallets in a number of shipments to the recycling plant. The bulbs, boxes and pallets were all destroyed and recycled together.														
The total estimated weight of pallets and boxes processed at the plant was subtracted from the total weight to be able to calculate the estimated number of bulbs processed (as shown in the table below). As the total weight of incandescent bulbs destroyed is over 38 tonnes, and an individual bulb weighs only 26 grams, and the weight of pallets and boxes must also be taken into account, there is understandably a slight discrepancy between the number of bulbs calculated from the waste processed and the number recorded in the exchange.														
<table> <tr> <td>Weight of pallet</td><td>15</td><td>kg</td></tr> <tr> <td>Bulb weight</td><td>0.026</td><td>kg</td></tr> <tr> <td>Empty box weight</td><td>0.125</td><td>kg</td></tr> </table>						Weight of pallet	15	kg	Bulb weight	0.026	kg	Empty box weight	0.125	kg
Weight of pallet	15	kg												
Bulb weight	0.026	kg												
Empty box weight	0.125	kg												
Shipment #	Total weight (kgs)	Total pallets	Total boxes	Average bulbs/box	Total bulbs									
1	2,990	16	6,048	13	77,287									
2	4,130	21	6,900	17	114,438									
3	2,730	17	5,900	11	67,345									
4	4,850	23	7,800	18	136,822									
5	3,410	17	6,426	14	91,153									
6	5,020	26	8,700	16	137,306									
7	3,550	17	6,426	15	96,579									
8	3,570	17	6,490	15	97,045									
9	3,080	15	5,670	15	83,188									
10	3,440	16	6,048	16	94,729									
TOTAL					995,891									
Files containing the table above - in Spanish in the independent report from EnviroSense SA de CV (<i>EnviroSense report Puebla_FINAL.pdf</i>) and in English in a calculation spreadsheet (<i>light bulb calculation at recycling plant - puebla.xlsx</i>) - have been provided to the DOE.														
<u>Exchange DMS Report (997,458)</u>														
The Exchange DMS Report (<i>ExchangeDMSReport.docx</i>), authored by the creator and host of the Customer Exchange database part of the Data Management System (DMS), calculates the total number of bulb exchanges, and therefore incandescent bulbs surrendered.														
In principle, the number of exchanges recorded (997,458) in this report should equate to the number of incandescent bulbs exchanged. However, in reality a number of issues must be taken into account to obtain the actual number of incandescent bulbs exchanged: the removal of test exchanges, system duplicates, and														

lost or non-recorded exchanges in the DMS. The Exchange DMS Report provides further particulars on these types of issues.

The table below, taken from a spreadsheet with supporting calculations to the Exchange DMS Report (*Impact Data DMS Final numbers.xls*), shows how the number of exchanges recorded (997,458) is adjusted for these issues to achieve the number of exchanges (987,146) which is equal to the number of incandescent bulbs exchanged as used in the ex-post Emission Reduction (ER) calculations.

Total Recorded Exchanges (A)	997,458	Total exchanges recorded in the DMS
Total System Duplicates (B)	16,434	Real System Duplicates, not system errors (i.e. when someone pressed the "Submission" button on the DMS interface twice, and therefore the exchanges were captured twice)
Total Test Exchanges (B1)	1,607	Test exchanges captured after the Luz Verdecita (pilot) and before the Comex employee and Coppel Employee days
Total Real Exchanges (C) = (A-B-B1)	979,417	Total recorded exchanges after system duplicates (B) and tests (B1) are removed, therefore, "real recorded" exchanges
Unique Customers with no Exchange Recorded (D)	1,929	This amount of customers are included in (E) - 246,363
Total Test Customers (D1)	59	Customers used as a test but removed from the final Customer list (E)
Total Customers Recorded in DMS (E)	246,363	This is the total amount of customers recorded in the DMS either with 0 (as per above), 1, 2, 3, 4 or more exchanges.
Average Exchange/Customer (F) = C/(E-D)	4.0069	Average exchange per household. Because the value is bigger than 4 (by 0.0069) this means that some houses clearly received more than 4 CFLs. If we multiply 0.0069 * 246,363 houses = 1,699 CFLs given "extra".
Exchanges of Customers in DMS with no Exchanges recorded (G)	7,729	There are 1,929 households (D) that appear in the system but with no exchanges (zero exchanges). By applying the Average Exchange/Customer value (4.0064) we obtain 7,729 exchanges that "should" appear there but do not appear.
Estimated Actual Total Exchanges (H) = (C+G)	987,146	The very final number of Exchanges therefore is 979,417 (C) + 7,729 (G)

Both the Exchange DMS Report (*ExchangeDMSReport.docx*) and supporting spreadsheet (*Impact Data DMS Final numbers.xls*) have been provided to the DOE.

ER Calculation Sheet – ex-ante (990,000)

The number of 990,000 incandescent bulbs is an ex-ante calculation (prior to project implementation) and is based on the values contained in the CPA-DD. It was based on best estimates prior to the exchange, with the final number to be determined after the exchange. It is equivalent to the total number of CFLs anticipated to

be distributed during the exchange (1,000,000), multiplied by the number of CFLs anticipated to be operational during the monitoring period (99%), as shown in the table on the following page. Note that the number of incandescent bulbs in the exchange is identical to the number of CFLs as it was a one-for-one exchange.

Monitored Variable	Description	Unit of measure	Value
L_k	Total CFLs Distributed	-	1,000,000
p	Proportion of CFLs operational during monitoring period	%	99.00%
$n_k = L_k \times p$	Number of CFLs operational during monitoring period	-	990,000
$n_i = n_k$	Number of corresponding ILBs operating in baseline scenario	-	990,000

These calculations are contained in the ex-ante ER calculation spreadsheet (*ER_calculations_MP1_Dec09-Nov10_ex-ante.xls*) provided to the DOE.

ER Calculation Sheet – ex-post (965,626)

It is important to note that the number of incandescents that is used in the calculation of emission reductions (965,626) is actually different to the figures explained above. It is equivalent to the total number of CFLs distributed during the exchange (987,146) (derived from the Impact Data report (*ExchangeDMSReport.docx*) and based on data on the number of bulb exchanges in the Data Management System, after any inconsistencies within the database (duplicate or blank records etc.) have been allowed for) multiplied by the number of CFLs operational during the monitoring period (97.82%) from the Project Cross Check Group survey (*Global Scan Final Report Nov 2010.xls*), as shown in the table below. Note that the number of incandescents in the exchange is identical to the number of CFLs in the exchange as it was a one-for-one exchange.

Monitored Variable	Description	Unit of measure	Value
L_k	Total CFLs Distributed	-	987,146
p	Proportion of CFLs operational during monitoring period	%	97.82%
$n_k = L_k \times p$	Number of CFLs operational during monitoring period	-	965,626
$n_i = n_k$	Number of corresponding ILBs operating in baseline scenario	-	965,626

These calculations are contained in the ex-post ER calculation spreadsheet (*ER_calculations_MP1_Dec09-Nov10_v3.xls*) provided to the DOE.

Documentation Provided as Evidence by Project Participant:

<p>EnviroSense report Puebla_FINAL.pdf light bulb calculation at recycling plant – puebla.xlsx ExchangeDMSReport.docx Impact Data DMS Final numbers.xls ER_calculations_MP1_Dec09-Nov10_ex-ante.xls ER_calculations_MP1_Dec09-Nov10_v3.xls Global Scan Final Report Nov 2010.xls</p>	
Information Verified by Lead Assessor:	
<p>EnviroSense report Puebla_FINAL.pdf light bulb calculation at recycling plant – puebla.xlsx ExchangeDMSReport.docx Impact Data DMS Final numbers.xls ER_calculations_MP1_Dec09-Nov10_ex-ante.xls ER_calculations_MP1_Dec09-Nov10_v3.xls Global Scan Final Report Nov 2010.xls</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	
<p>The approach provided by the PP for the estimation of the number of bulbs based on the third party report has been found to be in line with the PDD and also consistently reported. Also, the number of CFLs considered is on a conservative side and lower in numbers as compared to the projected values in the PoA-DD and CPA-DD. The number of CFLs distributed which is considered in the calculation of the emission reductions (987,146 CFLs) includes the extra CFLs given to some households (some households received more than 4 CFLs. The PP is requested to justify on this.</p> <p>It is reported that there were 1,929 households that appears in the system but that have no exchange record. The number of CFLs distributed which is considered in the calculation of the emission reductions (987,146 CFLs) includes the hypothetical number (7,729 CFLs = 1,929 household x 4.0064 CFLs/household) from these households with no exchange record. The PP is requested to clarify on this aspect as well. CL #02 remains open.</p>	
Acceptance and Close out by Lead Assessor: Open	Date: 17/09/2011
Project Participant Response:	Date: 28/09/2011
<p>Once the exchange program in November 2009 was complete, the creator and host of the DMS, Impact Data, undertook an analysis and audit of the final database to highlight any duplicate records and other data problems; their findings are contained in a report (<i>ExchangeDMSReport.docx</i>).</p> <p>This report takes the total number of recorded exchanges (997,458) and subtracts test records (1,607) and duplicates (16,434), resulting in the total number of “real” exchanges (979,417). An additional estimated number of exchanges (7,729) was then added for the 1,929 customers with no exchanges recorded in the database, based on the average number of exchanges in the system, on the assumption that their exchanges had somehow been lost. This resulted in an estimated total number of “actual” exchanges (987,146), which was the figure originally used in the emission reduction calculations.</p> <p>It has now been determined to take an even more conservative approach than that used by Impact Data in order to ensure a maximum of 4 exchanges can be verified per unique, identifiable customer.</p> <p>The final revised value for the number of eligible exchanges (954,706) is calculated using a new query over the total number of “real” exchanges (979,417) in the customer database (<i>Impact Data ILB wattage in DMS report v2 20110928.xls</i>). First, exchanges with an empty electricity bill identification number or address field (6,908) are excluded, reducing the valid exchanges to 972,509. Then, exchanges that could be considered to be above the limit of 4 per unique electricity bill identification number (17,803) are excluded, giving the final number of eligible exchanges (954,706). The average wattage of baseline incandescent bulbs exchanged (74.39 Watts) has also been recalculated based on this reduced number of exchanges.</p> <p>In addition, during the DOE’s verification site visit in Puebla in January 2011, a number of randomly selected</p>	

<p>houses that participated in the exchange were visited to check on a number of project parameters including the number of light bulbs they had exchanged. All houses checked reported that 4 light bulbs had been exchanged.</p> <p>The “hypothetical” 7,729 CFLs assigned to customers in the database with no exchanges recorded, and used in the calculation of the emission reductions (987,146 CFLs), was based upon an assumption that these customers would have the same average number of exchanges as the rest of the customers in the database. As the Monitoring Plan does not define the basis on which the total number of exchanges will be calculated, it was originally determined that this was an acceptable approach in line with the formulae and method described in the Monitoring Plan.</p> <p>However, upon review it has now been decided this is not the most conservative, verifiable approach, and the total number of exchanges has been revised (down to 954,706) with “hypothetical” exchanges excluded, as well any exchanges that could be considered above the limit of 4 per customer, or that could not be identified by unique electricity bill identification number or address.</p> <p>As the revised aggregate energy savings for the Monitoring Period (63.3 GWh) are still above the Small-Scale annual limit (60 GWh), the emission reductions claimed (27,665 tCO₂-e, as per the original CPA-DD), corresponding to the number of CERs requested for issuance, remain unchanged. The emission reduction calculations have been revised in version 4 of the Monitoring Report (<i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc</i>).</p>	
Documentation Provided as Evidence by Project Participant:	
<i>ExchangeDMSReport.docx</i> <i>Impact Data ILB wattage in DMS report v2 20110928.xls</i> <i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc</i> <i>ER Calculations MP1 Dec09-Nov10_v7.xls</i>	
Information Verified by Lead Assessor:	
<i>ExchangeDMSReport.docx</i> <i>Impact Data ILB wattage in DMS report v2 20110928.xls</i> <i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc</i> <i>ER Calculations MP1 Dec09-Nov10_v7.xls</i>	
Reasoning for not Acceptance or Acceptance and Close Out:	
<p>During the verification site visit the information on the advertisement for the CFL distribution was found to be limiting the replacement of 4 bulbs with 4 CFLs based on the electricity bill provided by the household. The photographic evidences of the lamp replacement were checked and found to be consistent hence accepted. Further it was checked during the site visit that the households have limited number of CFLs. The limit was set as 4 and there were no such household which had more than 4 CFLs. A random survey beyond the project sample group was also carried out during the site visit which revealed that there has been no exchange of more than 4 CFLs. Also the online DMS exchange interface limited each customer to exchanging a total of 4 bulbs each (based on electricity bill ID number), regardless of how many exchange locations the customer attended over the campaign. This information was checked live in the central exchange database at the time of the exchange, and made it impossible for the exchange personnel to enter more than 4 exchanges per customer. Further, the document ExchangeDMSReport.docx was checked for such exchanges were more than 4 bulbs could have been replaced, a total of 17,803 number of CFLs were found and PP removed them from the total on a conservative approach. The ExchangeDMSReport.docx and Impact Data ILB wattage in DMS report v2 20110928.xls was checked and found to be covering the aspect of total exchanges which included the records of 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. During the initial check of the information, the additional exchanges were also considered in the total number of CFLs as such the total number was calculated as 987,146. However, with further evaluation it was found that there was a possible double counting involved in the cases which did not have household which had no records. Thus to have a conservative approach for the total number of CFLs, the exchanges of hypothetical 7,728 households were not considered in the revised approach of emission reduction calculation. Thus the final value which was adopted correctly and conservatively by the PP for the purpose of emission reduction calculation was verified as 954,706. This approach was checked and found to be conservative and consistent thus accepted. With the revised number of CFLs the average wattage of the baseline incandescent bulbs exchanged was revised to 74.39 Watts.. The same was checked and found to be consistent in the Monitoring Report version 04 and hence accepted. Thus CL#02 was closed out</p>	
Acceptance and Close out by Lead Assessor: Closed	Date: 14/10/2011

Date:	27/01/2011		Raised by:	Assessment Team	
Type:	CL	Number:	3	Reference:	ER Excel Sheet
Lead Assessor Comment:				Date: 27/01/2011	
Following VVM 1.2 guideline 178 (d) & 184, PP is supposed to provide all monitored data sets inline to PoA-DD and applied methodology, please clarify how this requirement has been met especially for the operational hours of the CPF (parameter: monitoring use of project device), data used for calculating replaced ILBs in CPA under verification?					
Project Participant Response:				Date: 04/02/2011	

The calculation of ex-post Emission Reductions is shown in the table below.

Monitored Variable	Description	Unit of measure	Value
L_k	Total CFLs Distributed	-	987,146
P	Proportion of CFLs operational during monitoring period	%	97.82%
$n_k = L_k * P$	Number of CFLs operational during monitoring period	-	965,626
n_i	Number of corresponding ILBs operating in baseline scenario	-	965,626
p_i	Average power of ILBs replaced	Watts	74.59
p_k	Average power of CFLs distributed	Watts	17.01
H	Daily Hours of Use	Hours / day	3.234
MP	Length of Monitoring Period	Days	365
$o_k = H * MP$	Total average operating hours of CFL over Monitoring Period	Hours	1,180
EF	Emission Factor	kgCO ₂ /kWh	0.514
$BE_y = n_i * p_i * o_k * EF$	Total Baseline Emissions	tCO ₂ e	43,700
$PE_y = n_k * p_k * o_k * EF$	Total Project Emissions	tCO ₂ e	9,966
$ER_y = BE_y - PE_y$	Total Emission Reductions	tCO₂e	33,735

The values in the table above that were derived from monitoring or surveying data sets are:

- Total CFLs distributed (L_k)
- Proportion of CFLs operational during monitoring period (P)
- Average power of ILBs replaced (p_i)
- Average power of CFLs distributed (p_k)
- Daily hours of use (H)

An explanation of the data sets behind each of these variables and how the final values were derived (in line with the PDD and approved methodology AMS-II.C. v09) is provided below. Note that the Emissions Factor (EF) is calculated in accordance with the provisions in AMS I.D. in the validated PoA-DD and is set for the duration of the project crediting period.

Total CFLs distributed (L_k)

Once the exchange program in November 2009 was complete, the creator and host of the DMS, Impact Data,

undertook an analysis and audit of the final database; this process ensured each record was unique and prevented any double counting.

The table below shows how the number of exchanges recorded (997,458) was adjusted for any issues to achieve the number of exchanges (987,146) which is equal to the number of incandescent bulbs exchanged as used in the ex-post ER calculations in the table above.

Total Recorded Exchanges (A)	997,458	Total exchanges recorded in the DMS
Total System Duplicates (B)	16,434	Real System Duplicates, not system errors (i.e. when someone pressed the "Submit" button twice, and therefore the exchanges were captured twice)
Total Test Exchanges (B1)	1,607	Test exchanges captured after the Luz Verdecita (pilot) and before the Comex employee and Coppel Employee days
Total Real Exchanges (C) = (A-B-B1)	979,417	Total recorded exchanges after system duplicates (B) and tests (B1) are removed, therefore, "real recorded" exchanges
Unique Customers with no Exchange Recorded (D)	1,929	This amount of customers are included in (E) - 246,363
Total Test Customers (D1)	59	Customers used as a test but removed from the final Customer list (E)
Total Customers Recorded in DMS (E)	246,363	This is the total amount of customers recorded in the DMS either with 0 (as per above), 1, 2, 3, 4 or more exchanges.
Average Exchange/Customer (F) = C/(E-D)	4.0069	Average exchange per household. Because the value is bigger than 4 (by 0.0069) this means that some houses clearly received more than 4 CFLs. If we multiply 0.0069 * 246,363 houses = 1,699 CFLs given "extra".
Exchanges of Customers in DMS with no Exchanges recorded (G)	7,729	There are 1,929 households (D) that appear in the system but with no exchanges (zero exchanges). By applying the Average Exchange/Customer value (4.0064) we obtain 7,729 exchanges that "should" appear there but do not appear.
Estimated Actual Total Exchanges (H) = (C+G)	987,146	The very final number of Exchanges therefore is 979,417 (C) + 7,729 (G)

The entire database with a record for each one of the "real" exchanges and customers (adjusted to remove any inconsistencies or test exchanges) is contained in a file (*Impact Data ILB wattage in DMS report20100204.xlsx*). Impact Data's findings are contained in a report (*ExchangeDMSReport.docx*), with a separate spreadsheet containing the calculations behind the report, as shown in the table above (*Impact Data DMS Final numbers.xls*). All of these documents have been provided to the DOE.

Proportion of CFLs operational during monitoring period (P)

A randomly selected sample of 504 CFLs installed in participating households was surveyed by independent

market research organisation Global Scan in November 2010 to ensure continuing operation. The results of the survey, and the calculation resulting in the final figure for P , is provided in the table below.

Monitored Variable	Description	Unit of measure	Value
a	Lamps surveyed	-	504
b	Lamps installed & functioning	-	493
c	Lamps not installed	-	11
$P = b / a$	Proportion of CFLs operational during monitoring period	%	97.82%

The Global Scan report (*Global Scan Final Report Nov 2010.xlsx*) contains the entire dataset collected by Global Scan during the survey. The calculations in the table above are contained in a separate file (Tab 2 of *ER_calculations_MP1_Dec09-Nov10_v3.xls*). Both of these files have been provided to the DOE.

Average power of ILBs replaced (p_i)

The coordinating entity kept records of each household participating in the project activity, including the wattage of incandescent bulbs collected and subsequently destroyed. The weighted average power of the incandescent bulbs replaced during the exchange process is derived from nameplate data stored in the Data Management System (DMS).

The database (adjusted to remove any inconsistencies or test exchanges following an audit by the creator and host of the DMS, Impact Data) contains records of the nameplate data of every ILB surrendered in the exchange, and a combined weighted average of all these values. This information is contained in a file (*Impact Data ILB wattage in DMS report20100204.xlsx*) that has been provided to the DOE.

Average power of CFLs distributed (p_k)

As per Section B.5.2 of the validated CPA-DD, the average power of CFLs distributed is stated as 17.01 Watts. This figure is calculated as shown in the table below. This information is contained in a file (Tab 3 of *ER_calculations_MP1_Dec09-Nov10_v3.xls*) which has been provided to the DOE.

Monitored Variable	Description	% of Total	Wattage
	15W CFLs	59.80%	15
	20W CFLs	40.20%	20
p_k	Average power of CFLs distributed & operational during monitoring period	100.00%	17.01

Daily hours of use (H)

AMS IIC v9 provides the option to monitor either hours of use and power rating of the CFLs, or meter total energy consumption of light bulbs. The project proponents have chosen to measure hours of use along with recording the power rating of CFLs distributed. This choice complies with the chosen methodology, capturing all parameters required to be monitored.

The average daily hours of use of CFLs distributed during the monitoring period is calculated from data from the monitoring devices installed in the Project Sample Group (PSG). The metering equipment is web-enabled, allowing real-time collation of data, which is then transferred to a central server in Mexico.

The steps undertaken to calculate the average daily hours of use across the PSG for the Monitoring Period from this raw data is outlined below.

5. A computer program is run to automatically download raw data from the database server in Mexico to Melbourne.
 - *Output: raw data for each day in monitoring period for 240 bulbs*
6. The same computer program then runs a query over the raw data files to automatically calculate the hours of use for each of the 240 bulbs for each day of the monitoring period.
 - *Output: hrs of use for each day in monitoring period for 240 bulbs*
7. The entire database of processed data is copied and pasted into a tab within an excel spreadsheet (*monitoring data daily_all CPA1 MP1.xlsx*), which has been provided to the DOE.
8. This data for the monitoring period is manually checked for integrity.
9. From the hours of use for each day for the 24 bulbs, the excel spreadsheet calculates a single value for the average hours of use per bulb over the monitoring period. The statistical "Precision" is also calculated for the monitoring period to ensure that the data for the monitoring period remains within required limits (95% confidence level) as stated in Annex 8 of the PoA-DD.
 - *Output: average hrs of use over monitoring period for 240 bulbs*
 - *Output: Precision for the monitoring period*
10. The excel spreadsheet is sent to an independent statistical expert to verify that the calculations have been undertaken correctly and the resulting average hours of use over the monitoring period for 240 bulbs is in accordance with the requirements of the PDD and chosen methodology. This report (*Independent expert statistical review Nov10.pdf*) has been provided to the DOE.

Note that due to the conservative approaches in calculating the actual "on" time and accounting for lost data, the average "on" time calculated for the monitoring period can be considered to be the most conservative (minimum possible) value for this period.

The daily hours of use (H) is then multiplied by the number of days in the Monitoring Period (365 days) to obtain the total average operating hours of CFLs over the Monitoring Period (o_k).

Documentation Provided as Evidence by Project Participant:

Impact Data ILB wattage in DMS report20100204.xlsx
ExchangeDMSReport.docx

Impact Data DMS Final numbers.xls
Global Scan Final Report Nov 2010.xlsx
ER_calculations_MP1_Dec09-Nov10_v3.xls (Tab 2 and Tab 3)
monitoring data daily_all CPA1 MP1.xlsx
Independent expert statistical review Nov10.pdf

Information Verified by Lead Assessor:

Impact Data ILB wattage in DMS report20100204.xlsx
ExchangeDMSReport.docx

Impact Data DMS Final numbers.xls
Global Scan Final Report Nov 2010.xlsx
ER_calculations_MP1_Dec09-Nov10_v3.xls (Tab 2 and Tab 3)
monitoring data daily_all CPA1 MP1.xlsx
Independent expert statistical review Nov10.pdf

Reasoning for not Acceptance or Acceptance and Close Out:

<p>The approach provided by the PP for the estimation of the number of bulbs based on the third party report has been found to be in line with the PDD and also consistently reported. Also, the number of CFLs considered is on a conservative side and lower in numbers as compared to the projected values in the PoA-DD and CPA-DD. The number of CFLs distributed which is considered in the calculation of the emission reductions (987,146 CFLs) includes the extra CFLs given to some households (some households received more than 4 CFLs. The PP is requested to justify on this.</p> <p>It is reported that there were 1,929 households that appears in the system but that have no exchange record. The number of CFLs distributed which is considered in the calculation of the emission reductions (987,146 CFLs) includes the hypothetical number (7,729 CFLs = 1,929 household x 4.0064 CFLs/household) from these households with no exchange record. The PP is requested to clarify on this aspect as well. CL #02 remains open.</p>	
Acceptance and Close out by Lead Assessor: Open	Date: 17/09/2011
Project Participant Response:	Date: 28/09/2011
<p>Once the exchange program in November 2009 was complete, the creator and host of the DMS, Impact Data, undertook an analysis and audit of the final database to highlight any duplicate records and other data problems; their findings are contained in a report (<i>ExchangeDMSReport.docx</i>).</p> <p>This report takes the total number of recorded exchanges (997,458) and subtracts test records (1,607) and duplicates (16,434), resulting in the total number of “real” exchanges (979,417). An additional estimated number of exchanges (7,729) was then added for the 1,929 customers with no exchanges recorded in the database, based on the average number of exchanges in the system, on the assumption that their exchanges had somehow been lost. This resulted in an estimated total number of “actual” exchanges (987,146), which was the figure originally used in the emission reduction calculations.</p> <p>It has now been determined to take an even more conservative approach than that used by Impact Data in order to ensure a maximum of 4 exchanges can be verified per unique, identifiable customer.</p> <p>The final revised value for the number of eligible exchanges (954,706) is calculated using a new query over the total number of “real” exchanges (979,417) in the customer database (<i>Impact Data ILB wattage in DMS report v2 20110928.xls</i>). First, exchanges with an empty electricity bill identification number or address field (6,908) are excluded, reducing the valid exchanges to 972,509. Then, exchanges that could be considered to be above the limit of 4 per unique electricity bill identification number (17,803) are excluded, giving the final number of eligible exchanges (954,706). The average wattage of baseline incandescent bulbs exchanged (74.39 Watts) has also been recalculated based on this reduced number of exchanges.</p> <p>In addition, during the DOE’s verification site visit in Puebla in January 2011, a number of randomly selected houses that participated in the exchange were visited to check on a number of project parameters including the number of light bulbs they had exchanged. All houses checked reported that 4 light bulbs had been exchanged.</p> <p>The “hypothetical” 7,729 CFLs assigned to customers in the database with no exchanges recorded, and used in the calculation of the emission reductions (987,146 CFLs), was based upon an assumption that these customers would have the same average number of exchanges as the rest of the customers in the database. As the Monitoring Plan does not define the basis on which the total number of exchanges will be calculated, it was originally determined that this was an acceptable approach in line with the formulae and method described in the Monitoring Plan.</p> <p>However, upon review it has now been decided this is not the most conservative, verifiable approach, and the total number of exchanges has been revised (down to 954,706) with “hypothetical” exchanges excluded, as well any exchanges that could be considered above the limit of 4 per customer, or that could not be identified by unique electricity bill identification number or address.</p> <p>As the revised aggregate energy savings for the Monitoring Period (63.3 GWh) are still above the Small-Scale annual limit (60 GWh), the emission reductions claimed (27,665 tCO₂-e, as per the original CPA-DD), corresponding to the number of CERs requested for issuance, remain unchanged. The emission reduction calculations have been revised in version 4 of the Monitoring Report (<i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc</i>).</p>	
Documentation Provided as Evidence by Project Participant:	
<i>ExchangeDMSReport.docx</i> <i>Impact Data ILB wattage in DMS report v2 20110928.xls</i> <i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc</i> <i>ER_Calculations_MP1_Dec09-Nov10_v7.xls</i>	
Information Verified by Lead Assessor:	

ExchangeDMSReport.docx
Impact Data ILB wattage in DMS report v2 20110928.xls
CUIDEMOS Mexico CPA 1 Monitoring Report MP1 110928.doc
ER_Calculations_MP1_Dec09-Nov10_v7.xls

Reasoning for not Acceptance or Acceptance and Close Out:

During the verification site visit the information on the advertisement for the CFL distribution was found to be limiting the replacement of 4 bulbs with 4 CFLs based on the electricity bill provided by the household. The photographic evidences of the lamp replacement were checked and found to be consistent hence accepted. Further it was checked during the site visit that the households have limited number of CFLs. The limit was set as 4 and there were no such household which had more than 4 CFLs. A random survey beyond the project sample group was also carried out during the site visit which revealed that there has been no exchange of more than 4 CFLs. Also the online DMS exchange interface limited each customer to exchanging a total of 4 bulbs each (based on electricity bill ID number), regardless of how many exchange locations the customer attended over the campaign. This information was checked live in the central exchange database at the time of the exchange, and made it impossible for the exchange personnel to enter more than 4 exchanges per customer. Further, the document ExchangeDMSReport.docx was checked for such exchanges were more than 4 bulbs could have been replaced, a total of 17,803 number of CFLs were found and PP removed them from the total on a conservative approach. The ExchangeDMSReport.docx and Impact Data ILB wattage in DMS report v2 20110928.xls was checked and found to be covering the aspect of total exchanges which included the records of 1607 for test records, duplicates of 16,434 and hypothetical additional exchange of 7,728 which were not having any record in the database. During the initial check of the information, the additional exchanges were also considered in the total number of CFLs as such the total number was calculated as 987,146. However, with further evaluation it was found that there was a possible double counting involved in the cases which did not have household which had no records. Thus to have a conservative approach for the total number of CFLs, the exchanges of hypothetical 7,728 households were not considered in the revised approach of emission reduction calculation. Thus the final value which was adopted correctly and conservatively by the PP for the purpose of emission reduction calculation was verified as 954,706. This approach was checked and found to be conservative and consistent thus accepted. With the revised number of CFLs the average wattage of the baseline incandescent bulbs exchanged was revised to 74.39 Watts.. The same was checked and found to be consistent in the Monitoring Report version 04 and hence accepted. Thus CL#03 was closed out

Acceptance and Close out by Lead Assessor: Closed	Date: 14/10/2011
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Date:	27/01/2011	Raised by:	Assessment Team																										
Type:	CL	Number:	4	Reference:	MR																								
Lead Assessor Comment:		Date: 27/01/2011																											
The ER, mentioned in the MR, for the monitoring under verification is higher than the estimated in CPA-DD however following EB55 Annex 35, the claimed emission reductions have been capped by maximum estimated in the PDD for a year. Please explain the main reasons behind the difference between estimated emission reduction and actual achieved emission reduction.																													
Project Participant Response:		Date: 04/02/2011																											
<p>The ex-ante estimations of emission reductions were based on the best available data at the time of compiling the project documentation. It should be noted that no other CFL distribution project (CDM or otherwise) has conducted monitoring of all of the variables considered in the CPA monitoring plan, and made the results of this monitoring publicly available. When compiling the ex-ante estimates, there were essentially no directly comparable monitoring precedents on which base some assumptions. Unlike many other renewable energy project types, the use of carbon finance to deliver residential energy efficient lighting as has been achieved through implementation of the CPA, is globally unique. That there is some variation between the ex-ante estimates and the results of the monitoring is not therefore unexpected. The discussion below demonstrates that the variation between ex-ante and ex-post scenarios is due to the cumulative impact of a number of monitored variables (some increasing the expected emission reductions and others decreasing them). The monitoring report includes a discussion of variance between ex-ante estimations and ex-post calculation of emission reductions.</p> <p>The primary determinants of the difference between the ex-ante estimations and ex-post calculations of emission reductions are as follows:</p> <p>SUMMARY TABLE</p> <table border="1"> <thead> <tr> <th>Variable</th><th>Ex-ante Estimation</th><th>Ex-post Monitoring</th><th>+/- % Impact</th></tr> </thead> <tbody> <tr> <td>ILB Wattage</td><td>66.66</td><td>74.59</td><td>16.0%</td></tr> <tr> <td>Hours of use</td><td>3</td><td>3.234</td><td>7.8%</td></tr> <tr> <td>CFLs Distributed</td><td>1,000,000</td><td>987,146</td><td>-1.3%</td></tr> <tr> <td>Proportion of Distributed CFLs Operating</td><td>99%</td><td>97.82%</td><td>-1.2%</td></tr> <tr> <td>TOTAL</td><td></td><td></td><td>21.9%</td></tr> </tbody> </table>						Variable	Ex-ante Estimation	Ex-post Monitoring	+/- % Impact	ILB Wattage	66.66	74.59	16.0%	Hours of use	3	3.234	7.8%	CFLs Distributed	1,000,000	987,146	-1.3%	Proportion of Distributed CFLs Operating	99%	97.82%	-1.2%	TOTAL			21.9%
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<p>INCREASE IN EMISSION REDUCTIONS</p> <p>Incandescent bulb wattages: for the purpose of calculations presented in the CPA-DD, the project proponents estimated that the ILB wattages that would be exchanged would be evenly spread between 40, 60, 75 and 100W ILBs. In fact, households behaved more “rationally” than this, exchanging a higher proportion of 60W and 100W ILBs (and fewer 40W and 75W bulbs), thereby maximising the energy and dollar savings they achieved through the exchange process. This has resulted in a higher than predicted ILB average power rating for the CPA, thereby increasing the power difference and energy savings achieved through the CFL-ILB exchange.</p> <p>Ex-ante estimation: 66.66 Watts</p> <p>Ex-post calculation: 74.59 Watts</p> <p>Daily hours of use: for the purpose of ex-ante estimations of energy savings, the project proponents used a value of 3 hours use per day. This value was based on a conservative approach to data obtained from the literature on average residential lighting use in Mexico compiled by the World Bank and GEF, Estimates of lighting use in programme assessments of the Ilumex project are estimated to be 2.89 to 3.2 hours (see references below). Based on this literature the project proponents used a value of 3 hours per day. However, the results of the monitoring over the Monitoring Period showed that the average annual hours of use was closer to the higher end of this range.</p> <p>Ex-ante estimation: 3 hours/day</p> <p>Ex-post calculation: 3.234 hours/day</p> <p>DECREASE IN EMISSION REDUCTIONS</p> <p>Total number of bulbs distributed: the CPA-DD states that the project will aim to distribute up to 1 million CFLs to households. The final number of CFLs exchanged during the campaign was 987,146. This lower number of bulbs will reduce the emission reductions generated by the CPA.</p>																													

Ex-ante estimation: 1,000,000 CFLs
Ex-post calculation: 987,146 CFLs

Proportion of operational bulbs: in the CPA-DD the project proponent estimated that 99% of CFLs would be operational in year one of the crediting period. There is very little data from comparable projects on which to base this estimation, and as such the project proponents used a relatively conservative approach so as to not underestimate potential emission reductions.

Ex-ante estimation: 99%

Ex-post calculation: 97.82%

COMPARISON OF EX-ANTE AND EX-POST EMISSION REDUCTIONS

Based on the difference between the ex-ante estimates and ex-post monitoring results, the following difference in emission reductions for the monitoring period (1st December 2009 – 30th November 2010) are as follows:

Ex-ante estimation: 27,665 tCO₂

Ex-post calculation: 33,735 tCO₂

Documentation Provided as Evidence by Project Participant:

To assist with comparisons between the ex-ante estimations and ex-post calculations of emission reduction for the monitoring period, the project proponent has provided an Excel calculation sheet (tab “Ex ante Ex post Comparison”) demonstrating the impact of different variables on the calculation of emission reductions. This worksheet complements the ex-post emission reduction calculation sheet already provided to the DOE.

- ER_calculations_MP1_Dec09-Nov10_ex-ante.xls

The World Bank and GEF studies and assessments of the Ilumex project have been provided to the DOE for reference. These reports provided the basis on which 3 hours of use per day was used as an ex-ante estimate of residential lighting use.

- World Bank GEF Post-Implementation Impact Assessment (2006). *Mexico Ilumex Project*. See pages 53-54, section 8.1 for reference to daily hours of use.
- World Bank appraisal of GEF Ilumex project (1993). See section 3.4.1 page 4 for reference to hours of use.
- Independent Review of GEF and non-GEF Efficient Lighting Projects. See page 6, para 17 for reference to hours of use.

Information Verified by Lead Assessor:

To assist with comparisons between the ex-ante estimations and ex-post calculations of emission reduction for the monitoring period, the project proponent has provided an Excel calculation sheet (tab “Ex ante Ex post Comparison”) demonstrating the impact of different variables on the calculation of emission reductions. This worksheet complements the ex-post emission reduction calculation sheet already provided to the DOE.

- ER_calculations_MP1_Dec09-Nov10_ex-ante.xls

The World Bank and GEF studies and assessments of the Ilumex project have been provided to the DOE for reference. These reports provided the basis on which 3 hours of use per day was used as an ex-ante estimate of residential lighting use.

- World Bank GEF Post-Implementation Impact Assessment (2006). *Mexico Ilumex Project*. See pages 53-54, section 8.1 for reference to daily hours of use.
- World Bank appraisal of GEF Ilumex project (1993). See section 3.4.1 page 4 for reference to hours of use.

Independent Review of GEF and non-GEF Efficient Lighting Projects. See page 6, para 17 for reference to hours of use.

Reasoning for not Acceptance or Acceptance and Close Out:

<p>The reason for increase in ER has been explained by PP and reviewed by SGS team and it was concluded that there are several factors, behind the increased ER over estimated, and change in the wattage (CFL and ILB) and operational hours as dominating one. The submitted document was reviewed and the raised CAR has been closed and the issues of increased W of CFL. Further with the conservative approach as per the requirement of the approved deviation I-DEV-POA-0476, the emission reduction was found to be lowered than the one which was estimated in the registered CPA and based on the approach which was found to be in line with the I-DEV-POA-0476 Hence CL #04 was closed out.</p>	
Acceptance and Close out by Lead Assessor: Closed	Date: 30/07/2012

Date:	27/01/2011		Raised by:	Assessment Team	
Type:	CL	Number:	5	Reference:	MR
Lead Assessor Comment:				Date: 27/01/2011	
The referred link 16, for EB55 Annex 35, in the MR page 23 is not correct because it doesn't open the referred guidance. Please clarify.					
Project Participant Response:				Date: 04/02/2011	
Version 14.1 of EB55 Annex 35, as referenced in the MR, is identical to Version 14 except the document title was changed from "Guidelines to SSC CDM methodologies" back to its original title "General Guidelines to SSC CDM methodologies". The link to Version 14 is provided in the section below. A new and current version of the guidance, version 15, was released on 26 th November 2010. The link to this document is provided in the section below. The content of paragraph 3a) referred to in the MR remains unchanged in this updated version.					
Documentation Provided as Evidence by Project Participant:					
General Guidelines to SSC CDM methodologies, Version 14, EB55 Annex 35: http://cdm.unfccc.int/Reference/catalogue/document?doc_id=000002183 General Guidelines to SSC CDM methodologies, Version 15, EB58 Annex 23: http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf					
Information Verified by Lead Assessor:					
General Guidelines to SSC CDM methodologies, Version 14, EB55 Annex 35: http://cdm.unfccc.int/Reference/catalogue/document?doc_id=000002183 General Guidelines to SSC CDM methodologies, Version 15, EB58 Annex 23: http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf					
Reasoning for not Acceptance or Acceptance and Close Out:					
The weblinks were checked and found to be correct and hence accepted. Thus CL #05 was closed out.					
Acceptance and Close out by Lead Assessor: Closed				Date: 09/02/2011	

Date:	01/02/2011		Raised by:	Assessment Team		
Type:	CL	Number:	6		Reference:	AU4 1.1
Lead Assessor Comment:				Date: 01/02/2011		
The MR doesn't include the title of CPA on page one of MR and simply read CPA1. Please clarify?						
Project Participant Response:				Date: 02/03/2011		
The title has been added on page one of the revised monitoring report.						
Information Verified by Lead Assessor:						
MR version 02 dated 02/03/2011						
Reasoning for not Acceptance or Acceptance and Close Out:						
The title has been added so CL was closed.						
Acceptance and Close out by Lead Assessor: Closed				Date: 02/03/2011		

Date:	26/07/2012	Raised by:	Assessment Team
Type:	CAR	Number:	7
		Reference:	AU4 1.1
Lead Assessor Comment:		Date: 26/07/2012	
<p>A selection from the 240 CFLs which were monitored was checked during the onsite evaluation. It was observed that out of this selection, data for all the 365 days were not available for the sample of 240CFLs. PP/CME has to justify the provisions and procedures to be adopted for all such situations where the complete data for the monitoring period of the sample group of 240 CFLs would not be/may not be available.</p> <p>PP/ CME has to further justify the approach in line with requirements as per paragraph 208 (a) of VVM (Version 01.2) and in line with the I-DEV-POA-0476 for the period of monitoring from 01/12/2009 to 31/11/2010</p>			
Project Participant Response:		Date: 30/07/12	
<p>In the instances where the complete data for a monitoring period is unavailable the CME will calculate the average operating hours based on the data that is available as shown in "Tab4" of "ER_calculations_MP1_Dec09-Nov10_v3.xls". For example, if the total number of days where data is available is 170 out of 365 days, in order to estimate the daily average operating hours, the total operating hours will be divided by 365 instead of 170 as shown in "Tab4" of "ER_calculations_MP1_Dec09-Nov10_v3.xls".</p> <p>In the first monitoring period (1/12/09 to 30/11/2010), the mean operating hours of CFLs was originally calculated as 3.234 hours. Subsequently and in order to address the issue of the completeness of data raised in the request for review dated 20th September 2011, a more conservative approach was taken that resulted in a mean operating hours calculated as 2.134 hours. However, the precision of the revised average operating hours of the CFLs did not meet the 90/10 confidence/precision criteria as the precision was above 10% (i.e 10.33%).</p> <p>The CME had requested deviation proposing to use the lower value of the interval (instead of mean value of operating hours) for the first monitoring period.</p> <p>The request for deviation, I-DEV-POA-0476 entitled "Request for deviation from the precision level of 90/10 during the monitoring period from 01/12/2009 to 31/08/2012 for PoA applicable for CPA-2535-0001 only, CDM Reference No. 2535; CPA-2535-0001" was approved by the board on 24 July 2012.</p> <p>In line with the board's decision on deviation, the CME has applied 1.914 hours as σ_k which is conservative. σ_k has been calculated as below:</p> <p>For a mean of 2.134 hours with precision of +/- 10.33%, the lower value of interval is calculated as 1.914 hours.</p>			
Documentation Provided as Evidence by Project Participant:			
<i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1_260712_Clean</i> <i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1_260712_Track</i> <i>ER_calculations_MP1_Dec09-Nov10 v3_Values_Only</i> <i>ER_calculations_MP1_Dec09-Nov10_v3</i>			
Information Verified by Lead Assessor:			
<i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1_260712_Clean</i> <i>CUIDEMOS Mexico CPA 1 Monitoring Report MP1_260712_Track</i> <i>ER_calculations_MP1_Dec09-Nov10 v3_Values_Only</i> <i>ER_calculations_MP1_Dec09-Nov10_v3</i>			
Reasoning for not Acceptance or Acceptance and Close Out:			

Completeness of Data for the period 01/12/2009 to 30/11/2010.

During the data verification, out of 240 sample groups checked, the number of days of operation of the CFLs in the sample group was found to be in the range of 5 days to 359 days while the reported total number of days of monitoring was 365 days. The CME clarified that all the data available for the period was reported in the emission reduction excel sheet. The data missing in some of the CFLs was due to unexpected technical difficulties in individual pieces of monitoring equipment (Lean Radar) either measuring or transmitting the data at either bulb or household level. The range of technical difficulties that caused the missing data, as well as the process for treating missing data in the calculation of the average hours of use over the monitoring period, were contained in the document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0".

Further the CME clarified that neither the methodology (AMS II.C. version 09) nor the CPA-DD specifically requires all 240 bulbs to be monitored for 365 days and as such there was no procedure clearly available for the missing days. Complying with the monitoring plan, all 240 CFLs were monitored over the monitoring period, and were shown to be statistically representative and within required confidence levels, with the missing data occurring at random and without seasonal bias. In treating lost data, the most conservative approach theoretically possible was used. The CME clarified that by taking all the available data it attempted not to introduce any bias to the data calculations. The independent statistical expert at Melbourne University has reviewed the data and calculation methods used, and has confirmed via an independent letter sent to the CME dated 15/12/2010 (Statistical Consulting Centre, The University of Melbourne) and further by independent letter to the CME dated 22/09/2011 (Statistical Consulting Centre, The University of Melbourne) that the sampled data and calculation methods are sufficient and statistically valid to provide an accurate, reliable and unbiased representation of the average daily hours of use for the population, compliant within the requirements in the CPA- DD and the "General Guidelines For Sampling And Surveys For Small-Scale CDM Project Activities (Version 01)". It can be noted that during the validation of the project, the tool was not available.

However, referring to the paragraph 208(a) of VVM 1.2, the CME considered the theoretically most conservative approach which was available for the consideration of the monitoring of the 240 CFLs under the sampling plan. A conservative approach of considering 365 days of operation for all the 240 CFLs was adopted and the emission reduction calculation was revised. Based on the revision, the average hours of operation for the CFLs was 2.134 hours/day which was found to be conservative in terms of the actual number of days of operation and hence accepted.

The document "CUIDEMOS Mexico CPA 1 PSG Monitoring Data Evaluation v1.0" was checked and the data was found to be correctly reported. Further, the requirement of the methodology AMS II.C version 09 was checked and the requirement of the number of days of operation of the monitoring equipment was not found to be a required parameter. A selection from the 240 CFLs which were monitored were checked during the onsite evaluation. It was observed that out of this selection, data for all the 365 days was not available for the sample of 240 CFLs. As such, to be on the theoretically most conservative approach, the CME undertook 365 days as average operation for all the 240 CFLs. This was found to be in line with the requirements as per paragraph 208 (a) of VVM (Version 01.2) and thus accepted.

Impact of Completeness of Data for the period 01/12/2009 to 30/11/2010 on 90/10 confidence/ precision level and conservative approach with deviation.

Due to the conservative approach of using the average of 365 days of operation for the sample of 240 CFLs, the result showed the precision of the average operating hours of CFLs was greater than 10, i.e the 90/10 confidence/precision criterion was not met.

In order to address the issue, CME adopted the conservative approach of considering the lower value of the interval (instead of mean value of operating hours). For a mean of 2.134 hours with precision of +/- 10.33%, the lower and upper values of interval are 1.914 hours and 2.355 hours respectively. The available range of the operating hours available based on the conservative approach of 365 days is at 1.914 hours and 2.355 hours. Based on this range, the earlier approach which was considered was to apply the mean of 2.134 hours, however, considering the range, a conservative approach would be to consider 1.914 hours. Since this is the lower range being considered as per the provisions of VVM para 208(a) this can be considered as theoretically most conservative approach. Thus at a confidence interval of 90%, for the lower value of the interval there is a 5% chance that the true operating hours are below this figure. This was checked and found to be a conservative approach considering the fact that the monitoring plan of the POA-DD / CPA-DD does not cover the aspect of non compliance with the level of precision level. Further, during the validation of the project, the General Guidelines For Sampling And Surveys For Small-Scale CDM Project Activities (Version 01) was not available and thus applying the lower value of the interval is more conservative as there is only a 5% chance that the true operating hours are below this value of 1.914 hours. Therefore, the CME has applied the lower value of the interval i.e. 1.914 hours for emission reduction calculation, which is conservative as per VVM para 208(a) and acceptable. Based on the above approach, the precision level was deviated from the provisions of the project and thus CME requested a deviation for the period from 01/12/2009 to 30/11/2010 which was approved by the EB on 24/07/2012

With the conservative approach of considering the data for the 240 samples in line with the para 208(a) of VVM 1.2 in addressing the number of days of operation as 365 and also considering the lower limit of the interval of operation i.e, 1.914 hours, the CME has considered this conservative approach on both the completeness of data and also on the precision level and thus it was not necessary for a revision of the monitoring plan for the current monitoring period (01/12/2009 to 30/11/2010). Further, it was checked and found that there has been no such change in the project design in terms of the project equipment details like CFL specification etc due to this deviation from the provisions mentioned in the POA-DD or CPA-DD document.

This approach was found to be consistent with the approval of I-DEV-POA-0476 received on 24/07/2012 and hence accepted.

The excel sheet provided is not complete as there are some missing values in number of spread sheets (e.g. "Work sheet Tab 4 has some missing data").

It is the compatibility of Excel .xls and .xlsx which has created the problem and when one works on the 2007/2010 version of MS Excel and when edit the file there would be no error shown. This has been a problem at the UN interface earlier and they do not accept .xlsx files (2007 compatible). When one saves the worksheet in 2007 converted to 2003 format there is error on incompatibility. Thus, the file when viewed on 2007 platforms are back on compatibility mode and do not show an error as compared to the UN system which works on 2003 platform and thus having an error or has "missing data in Tab 4". So every time one would try to save it would be showing an error on compatibility and would result in error or missing data when the file is opened in MS Excel 2003 platform. Two excel sheet are provided now with one having links of Tab 4 and PSG data sheet and the other one having direct data (typed values) from the PSG data without the formulae which was checked and found to be consistent and without error. The two excel sheets ER_calculations_MP1_Dec09-Nov10 v3_Values_Only and ER_calculations_MP1_Dec09-Nov10_v3 were checked and were found to be consistent and thus accepted.

Acceptance and Close out by Lead Assessor: Closed	Date: 30/07/2012
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Date:	10/10/2012	Raised by:	Assessment Team		
Type:	CAR	Number:	8	Reference:	AU4 3.6
Lead Assessor Comment:			Date: 10/10/2012		
<p>The monitoring of CPA: CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Puebla version 6 page 19 has stated that every household meter receives a routine re-calibration and maintenance check at least every three years. The CME is requested to clarify this in line with the requirement of the registered monitoring plan of the CPA which does not mention about the calibration of the equipment. Furthermore, the CME has to clarify the date of the calibration if any for the LEAN Radar equipments and if the calibration is not available clarify if hour meters have been calibrated and whether the calibration validity covers this monitoring period from 01/12/2009 to 30/11/2010. CME is requested to clarify this in line with VVM para 184, 205(c) and in accordance with EB 52 Annex 60</p>					
Project Participant Response:			Date: 12/10/2012		
<p>The registered monitoring <u>plan</u> states that the monitoring equipment will be spot checked to ensure ongoing functionality and accurate calibration. The letter provided by the manufacturer of the monitoring equipment, Lean Radar states " that it is sufficient for a routine maintenance check to be carried out every three years".</p> <p>The monitoring <u>report</u> states that "every household meter receives a routine re-calibration and maintenance check at least every three years"</p> <p>This is consistent with the manufacturers recommendation and the UNFCCC General Guidelines to SSC CDM Methodologies. EB61 Annex 21, 17.C, which states "Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years;"</p> <p>With regards to VVM para 184, 205(c) and in accordance with EB 52 Annex 60, section C.8 states "In cases where neither the monitoring methodology, nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, the DOE shall ensure that the equipments are calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer specification."</p> <p>Installation of the equipment in the 60 monitored houses occurred during the period September to November 2009 and was completed on November 7th 2009 (refer to the Lean Radar letter). Use of the equipment for monitoring commenced on December 1st 2009.</p> <p>Therefore re-calibration of all monitoring equipment was not required during the period from 01/12/2009 to 30/11/2010 and as such re-calibration of all devices did not occur during this period.</p>					
Documentation Provided as Evidence by Project Participant:					
CUIDEMOS Mexico CPA 1 Monitoring Report MP1					
Information Verified by Lead Assessor:					
CUIDEMOS Mexico CPA 1 Monitoring Report MP1 dated 11/10/2012 parameter α_k					
Reasoning for not Acceptance or Acceptance and Close Out:					
<p>Since the registered monitoring plan does not talk of the frequency of calibration of the LEAN Radar equipments which are used for the monitoring of the CFLs, In cases where neither the monitoring methodology, nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, the DOE shall ensure that the equipments are calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer specification, has been adopted by the PP which was found to be acceptable. The installation of the equipments were done by the LEAN Radar equipment supplier on 07/11/2009 which was checked with the installation completion letter to Cool nrg by Lean Radar Energy Solutions Center dated 07/11/2009 by the Ing. Luis Lopez Olivos, Director Administrative, Lean Radar Energy S. de R.L. Further, on 20/04/2010, the Hardware Technology Development Engineer, Lean Radar Energy S.de RL declared that the calibration would be required every three year from the date of installation i.e. 07/11/2012. The documents were checked and found to be consistent in terms of the calibration of the LEAN Radar and the calibration was found to be covering the current monitoring period and thus no calibration was required to be done for the equipment during the monitoring period and thus accepted. As no gap in calibration has been identified hence EB 52 Annex 60 has not been applied.</p>					
Acceptance and Close out by Lead Assessor: Closed			Date: 18/10/2012		

10. Statement of Competence

Name: Shivaji Chakraborty

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)

x

Technical Area(s):

TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar

TA 1.2 Energy generation from renewable energy sources

2. Energy Distribution

x

Technical Area(s): TA 2.1 Electricity distribution

TA 2.2 Heat distribution

3. Energy Demand

x

Technical Area(s): TA 3.1 Energy Demand

4. Manufacturing

Technical Area(s):

5. Chemical Industry

Technical Area(s):

6. Construction

Technical Area(s):

7. Transport

Technical Area(s):

8. Mining/Mineral Production

Technical Area(s):

9. Metal Production

Technical Area(s):

10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

11. Fugitive Emissions from Production and

Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

12. Solvent Use

Technical Area(s):

13. Waste Handling and Disposal

Technical Area(s):

14. Afforestation and Reforestation

Technical Area(s):

15. Agriculture

Technical Area(s):

Approved Member of Staff by: Siddharth Yadav

Date:

19/09/2012

Name: Magdalena Cruz

Status

- Lead Assessor		- Expert	
- Assessor		- Financial Expert	
- Local Assessor	Mexico	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	
Technical Area(s):	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 06/02/2012

Name: Joe Sun

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input checked="" type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
Technical Area(s):	
2. Energy Distribution	<input type="checkbox"/>
Technical Area(s):	
3. Energy Demand	<input type="checkbox"/>
Technical Area(s):	
4. Manufacturing	<input type="checkbox"/>
Technical Area(s):	
5. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
6. Construction	<input type="checkbox"/>
Technical Area(s):	
7. Transport	<input type="checkbox"/>
Technical Area(s):	
8. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
9. Metal Production	<input type="checkbox"/>
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
Technical Area(s):	
12. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
13. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
14. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
15. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 11/09/2012

Name: Sandeep Kurmi

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	x
Technical Area(s): TA 3.1 Energy Demand	
4. Manufacturing	x
Technical Area(s): TA4.n Other-Air Compression and Separation Units	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 21/09/2012

11. Photographic Evidence

Unique reference number: Puebla State
Name of equipment: Lean Radar

Parameter: Monitoring use of project device
Date: 25/01/2011



12. Annexure

Filed Survey Report

SGS Reference Number: CDM.VER0993PoA

Visit Number:

Company Name: Cool nrg Carbon Investments Pty Ltd	Dates on site:
City of CPA implementation:	Name of the person collected the data:
Type of household (With or without monitoring device):	
Address of surveyed house:	

Sr. No	Information required	Feedback on site
1.	Number of CFLs installed	
2.	Number of CFLs in operation during site visit	
3.	Wattage of CFL installed	
4.	Date of damage/discard for any CFL(s) in house	
5.	Treatment of discard CFL	
6.	Collected from Coppel / Comex	
7.	Date of Distribution of CFL	
8.	Date of Installation of CFL	
9.	Identification number of Monitoring Device (Lean Radar)	
10.	Is the monitoring device was found in operation during visit	
11.	Installation position of monitoring device in house	
12.	Additional information if any	
13.	Household feedback for the operation hours	

Name of household owner	
Signature of household owner	
Signature of SGS Auditor	

12
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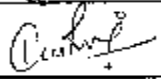
CDM.VER0993PoA

Field Survey Report

SGS Reference Number: CDM.VER0993PoA
Visit Number: 01

Company Name: Cool 119 Carbon Investments Pty Ltd	Dates on site: 25-01-2011
City of CPA implementation: Puebla Mx.	Name of the person collected the data: Karish Singh
Type of household (With or without monitoring device): with monitoring.	
Address of surveyed house: Jose Asuncion It. 16 m28 balcones del sur	

Sr. No	Information required	Feedback on site
1.	Number of CFLs installed	4
2.	Number of CFLs in operation during site visit	4
3.	Wattage of CFL installed	18
4.	Date of damage/discard for any CFL(s) in house	NA
5.	Treatment of discard CFL	NA
6.	Collected from Coppel / Comex	Coppel
7.	Date of Distribution of CFL	Nov' 09
8.	Date of Installation of CFL	Nov' 09
9.	Identification number of Monitoring Device (Learn Reader)	32
10.	Is the monitoring device was found in operation during visit	Yes
11.	Installation position of monitoring device in house	Right
12.	Additional information if any	NA
13.	Household feedback for the operation tours	3 to 4 hours

Name of household owner	MORANUA FELIZ
Signature of household owner	
Signature of SGS Auditor	

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