



POA VALIDATION REPORT BALAJI GREENTECH PRODUCTS LIMITED

VALIDATION OF THE “Manufacture and Distribution of CFLs in India”

REPORT NO. INDIA-VAL/276.49/2012

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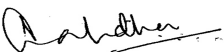
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Client: Balaji Greentech Products Limited	Client ref.: Mr. G Hemanth Reddy

Summary:
Bureau Veritas Certification has conducted the validation of the PoA project titled "Manufacture and Distribution of CFLs in India" a CDM project of M/s. Balaji Greentech Products Limited; whose manufacturing plant is located at village Nandikandi; District Medak in the State of Andhra Pradesh, India. The distribution of CFLs (i.e. Compact Fluorescent Lamps) would be in various areas of entire host country i.e. India. The programme will be executed based on the UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM PoA rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the programme design document(s), the programme's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology AMS II C, version 13 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: INDIA-val/276.49/2012	Subject Group: CDM
PoA title: Manufacture and Distribution of CFLs in India	Indexing terms Work Approved by Mr. Flavio Gomes 
Work carried out by: Bhavesh Prajapati – Team Leader Sanjay Patankar - Team Member Hitesh Karandikar - Team Member Sushil Budhia & Associates – Financial Expert	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution
Internal Technical Review carried out by: H B Muralidhar 	
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Abbreviations

BGPL	Balaji Greentech Products Ltd.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reductions
CFL	Compact Fluorescent Lamp
CL	Clarification Request
CO ₂	Carbon Dioxide
CPA DD	CDM Project Activity Design Document
DOE	Designated Operational Entity
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
INR	Indian Rupees
MoV	Means of Verification
NGO	Non Government Organization
PCN	Project Concept Note
PPA	Power Purchase Agreement
PCF	Prototype Carbon Fund
POA DD	Program of Activities Design Document
PO	Purchase Order
TEVR	Techno Economic Viability Report
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

M/s. Balaji Greentech Products Ltd. has commissioned Bureau Veritas Certification to validate its PoA project "Manufacture and Distribution of CFLs in India" whose manufacturing plant is located at village Nandikandi in Sadashivpet mandal at Medak district in the state of Andhra Pradesh in India and distribution of CFLs is intended in the entire host country, India, under the context of various Component of Project activities (CPAs).

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

This report summarizes the findings of the validation of the Programme, performed on the basis of UNFCCC criteria, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The validation scope is defined as an independent and objective review of the POA DD, a generic CPA DD and a specific CPA DD, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The validation 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 Validation team

The validation team consists of the following personnel:

FUNCTION	NAME	CODE HOLDER*	TASK PERFORMED
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Lead Verifier	Bhavesh Prajapati	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI
Verifier	Sanjay Patankar	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Verifier	Hitesh Karandikar	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI
Technical Specialist	Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Financial Specialist	Sushil Budhia & Associates	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Internal Technical Reviewer (ITR)	H B Muralidhar	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Specialist Supporting ITR	Not Applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Report Approval	Flavio Gomes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input checked="" type="checkbox"/> RI

* DR – Document Review, SV – Site Visit, RI – Report Issuance

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a POA project activity is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The completed validation protocol is enclosed in Appendix A to this report.

The validation of the POA consisted of the following steps viz;

- Contract Review
- Validation team appointment
- Publication of the following DD's for global stakeholder comments;
 - The CDM-SSC-POA-DD (POA-DD)
 - The generic CDM-SSC-CPA-DD (gCPA-DD)
 - The specific CDM-SSC-POA-DD (sCPA-DD)



A desk review of all above mentioned DD's and additional supporting documents included;

- Validation planning,
- A desk review of the DDs (PoA-DD, gCPA-DD, sCPA-DD) submitted by the Project Participant and additional supporting documents with the use of customized validation protocol according to the Validation and Verification Manual;
- Site visits;
- Background investigation and follow-up interviews with personnel of the project developer and its contractors;
- Draft validation report (DVR);
- Resolution of corrective actions and clarification requests
- Final validation report;
- Internal Technical Review;
- Final approval of the validation;

2.1 Review of Documents

The published CDM-SSC-POA-DD (Ref/1/), gCPA-DD (Ref/2/) and sCPA-DD (Ref/3/) submitted by the Project Participant and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the POA Design Document (POA-DD), Approved methodology, Kyoto Protocol, Clarifications on Validation Requirements to be Checked by a Designated Operational Entity were reviewed.

Bureau Veritas Certification validates the following information provided by the client in the PoA-DD:

- The correct application of the baseline and monitoring methodology and tools,
- Coordinating/managing entity, host party and PoA Participants
- Geographical boundaries of the PoA including all national and/or sectoral policies and regulations;
- Policy, measure or stated goal of the PoA;
- Confirmation about voluntary action by the coordinating/managing entity;
- The programme's baseline study;
- Demonstration of additionality of the PoA;
- Description of a typical CPA (including technology or measures, baseline and monitoring methodology justification and application, demonstration of additionality, and accounting for leakage);
- Eligibility criteria designed for the inclusion of CPAs in the PoA, including criteria to be used for demonstration of additionality of a CPA, if applicable;
- Starting date and length of the PoA;



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- Operational and management arrangements established by the coordinating/ managing entity for the implementation of the PoA, including
 - a record keeping system for each CPA under the PoA,
 - a system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA,
 - the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA;
- Monitoring plan for a CPA with record-keeping system;
- Indicators/data to be monitored and reported;
- Statistically sound sampling method to be used for verification;
- Environmental impacts and analysis;
- Stakeholder Consultation Procedure as required under the CDM Rules;
- Public funding;
- Letter(s) of Approval as required under the CDM Rules.

Bureau Veritas Certification validates the following information provided by the client in the gCPA-DD:

- Unique identification of the CPA by location or if applicable by registration code;
- Contact details of persons responsible for each CPA;
- Host party;
- Starting date and duration of the crediting period;
- Eligibility criteria;
- Demonstration of additionality;
- Baseline greenhouse gas emissions;
- Estimated emission reductions;
- Environmental impacts and analysis;
- Stakeholder consultation procedure;
- Confirmation regarding no prior CDM registration or inclusion in another PoA;
- Consistency between POA-DD and the gCPA-DD.

Bureau Veritas Certification validates the real-case CPA-DD (sCPA-DD) with respect to

- Consistency with the PoA-DD;
- Consistency with the generic CPA-DD;
- Additionality;
- Eligibility criteria fulfillment;
- Emission reduction calculation;
- Monitoring plan;
- Environmental impacts;
- Local stakeholder consultation process.

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To address Bureau Veritas Certification corrective action and clarification requests, the Project Participant revised the DD's and resubmitted it in September 2012.

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The validation team's findings presented in this report relate to the project as described in the POA-DD, version 6.

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2.2 Follow-up Interviews

On 25/05/2010 to 26/05/2010 the validation team of Bureau Veritas Certification conducted site visits and performed interviews with project stakeholders to confirm selected information and to discuss issues identified in the document review. Representatives of the M/s. Balaji Greentech Pvt. Ltd. (Project Participant), Ernst & Young Private Ltd. (CDM PoA Consultants) and Local stakeholders were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1. Interview topics

Interviewed organization	Interview topics
Balaji Greentech Products Ltd. (Project Participant)	<ul style="list-style-type: none"> ➤ Chronological description of the programme activity along-with key steps of the implementation. ➤ Current status of programme design ➤ Technical details of the programme realization, ➤ programme feasibility, designing, operational life time, monitoring of the programme ➤ Host Country Approval ➤ Monitoring and measurement equipment and System (including monitoring of CPAs) ➤ Financial aspects (Additionality) ➤ Programme activity starting date ➤ Start date of CPA ➤ CER allocation / ownership ➤ Baseline study assumptions ➤ Sustainable development issues, Analysis of local stake holder consultation ➤ Roles & responsibilities of the project participants with respect to programme management, monitoring and reporting ➤ National Legislation ➤ Editorial issues of the PoA-DD, genericCPA-DD & specific CPA-DD
Local Stakeholders	<ul style="list-style-type: none"> ➤ Views and concerns about the Project Activity ➤ Confirmation of the local stakeholder meeting conducted by Balaji Greentech Products Ltd.

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Ernst & Young Private Ltd. (CDM PoA Consultants)	<ul style="list-style-type: none"> ➤ Methodology application ➤ Baseline determination & emission factor ➤ Additionality ➤ Monitoring Plan ➤ GHG Calculations ➤ Supporting data, evidences and documentation ➤ Resolution of CAR's and CL's
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2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

Corrective Action Requests (CAR) is issued, where:

- a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- b) The CDM requirements have not been met;
- c) There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the validation process, the concerns raised are documented in more detail in the validation protocol in Appendix A.

2.4 Internal Technical Review

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Lead Verifier provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme.



This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier and Validation Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the PP(s) the finalized validation report is accepted for further processing such as uploading on the UNFCCC webpage.

3 VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 22 Corrective Action Requests and 34 Clarification Requests.

The number between brackets at the end of each section correspond to the VVM paragraph

3.1 Approval (49-50)

M/s. Balaji Greentech Products Ltd. is the coordinating and managing entity of the PoA. India is the only host party in the said Programme of Activity. The Project participant, M/s Balaji Greentech Products Ltd., has obtained approval from the DNA of India and has provided a copy of the Letter of Approval (LOA) (Ref/7/) to the validation team. The letter of approval clearly states that the Host country has ratified the Kyoto



Protocol and the approval is for voluntary participation in CDM project activity. Also, the letter of approval mentions that project contributes to sustainable development of the Host country. The letter of approval is unconditional with respect to the party to the Kyoto Protocol, voluntary participation, contribution to sustainable development and title of project activity. The validation team confirms that this letter is in accordance with paragraphs 45 – 48 of VVM version 1.2.

Bureau Veritas Certification received this letter from the project participant and does not doubt its authenticity since the validation team verified the original copy of the Host Country Approval, which has been signed and issued by the Member Secretary of the NCDMA.

The title and contents of the letter of approval refer to the precise proposed CDM project activity title in the PDD being submitted for registration.

CAR 1 was raised as PP did not submit Host country Approval at the start of the validation. During validation process, PP submitted a copy of HCA. The validation team reviewed this and found that the HCA is issued by Ministry of Environment and Forest, i.e. DNA of the Host country vide reference no. 4/10/2010-CCC dated 28 September 2010. The same is issued in the name M/s. Balaji Greentech Products Limited (Coordinating and managing entity). The title of the HCA is "Manufacture and Distribution of CFLs in India". The validation team also noted that the title of the project activity and Managing and coordinating entity is consistent with the PoA-DD and Specific CPA DD, hence, closed the CAR.

3.2 Participation (54)

India is the only party involved in the project activity at this stage. The participation of the project participant in the proposed CDM project activity has been approved by the DNA of Host Country, India who is also a party to the Kyoto Protocol. The host party of the project has ratified the Kyoto protocol on 26 August 2002. The validation team confirmed the same from UNFCCC website <http://maindb.unfccc.int/public/country.pl?country=IN>.

The participation of project participant has been approved by a Party of the Kyoto Protocol. The validation team concluded this by reviewing the original Host Country Approval (HCA) (Ref /7/)

3.3 Project design document (57)

The validation team confirms that the PoA-DD, CPA-DD complies with the latest forms and guidance documents for completion of the DD. The POA-DD is as per Guidelines for Completing the Simplified Project Design Document (CDM-SSC-POA-PDD) (Version 01, EB 33, Annex 43)



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3.4 Changes in the Project Activity

The final POA-DD, Version 6 has the following changes with respect to version 1 (Ref /1/) which was webhosted.

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1. Description of the proposed project activity and the scenario existing prior to the project activity has been transparently described for better clarity in Section A.2.
2. Eligibility criteria defined for inclusion of the SSC-CPA in a POA has been revised in Section A.4.2.2 in line with EB 65, Annex 3, for better clarity.
3. Sampling criteria is defined in line with General guidelines for sampling and surveys for small-scale CDM project activities' version 1, Annex 30, EB 50, (the sampling software will be used to determine the sample size), also in line with the EB 65, Annex 2.
4. The algorithms to calculate the baseline and project emissions have been revised to be in line with the applied methodology.
5. The type of financial indicator has been finalized out of the two opted in the web hosted PDD (i.e. NPV and Post tax Project IRR). Finally selection of Post tax Project IRR as financial indicator was justified by the PP. Further, the calculation of the Post tax Project IRR has undergone changes for the demonstration of the additionality during course of validation.
6. Explanation of the CDM consideration process and the chronology of events has been detailed out in Section A.4.3
7. Monitoring plan is revised to transparently describe the process of metering and monitoring at site. Archiving methods are also clearly stated.

CAR 2 was raised since the webhosted PoA-DD form was altered than the UNFCCC guideline, also date of completion of PoA-DD was mentioned as December 2008. In response, PP corrected the POA-DD, hence, the CAR was closed.

The validation team hereby confirms that the POA-DD & CPA-DD complies with the latest POA template (http://cdm.unfccc.int/Reference/PDDs_Forms/PoA/PoA_form02_v01.doc) & CPA-DD format (http://cdm.unfccc.int/Reference/PDDs_Forms/PoA/PoA_form01_v01.doc) for completion of the POA & CPA-DD.

3.5 Project Description (64)

The proposed CDM PoA is implemented by M/s. Balaji Greentech Products Limited (BGPL). The proposed CDM programme of activity



involves setting up a CFL manufacturing unit and free distribution of CFLs in India. The CFL manufacturing unit has been implemented at Nandikandi village in Sadashivpet mandal of Medak district in the state of Andhra Pradesh. The CFLs manufactured by BGPL (PP) will be distributed in various locations of the host country, India.

The Project Participant will manufacture CFLs of different wattages, design, shapes and sizes. The PP under the proposed CDM PoA, intends to manufacture and distribute 9W, 15W, 20W CFLs free of cost which will replace 40W, 60W and 100W of ILs respectively. In general, the life of CFLs is as high as 10,000 - 20,000 hours whereas the baseline incandescent lamps (ILs) have a life of only 750 - 2000 hours. Validation team confirmed this from the website of Indian Institute of Technology, Mumbai (Ref /8/). The referred website is a presentation of Prof. Suryanarayana Doola from Indian Institute of Technology, Mumbai, who has referred the lifetime of CFLs and ILs from American Council for EE Economy. The presentation is a part of CEP Course on Energy Management at IIT, Mumbai. The validation team reviewed this third party and publicly available source, which is also used in academic field and hence, accepted the same as credible document for the acceptance of lifetime of the CFLs and ILs. Further, the validation team also reviewed a presentation of Secretary General of ELCOMA, which states that the lifetime of CFLs is 6-12 times than GLS i.e. ILs.

The PP has clarified in the revised PoA DD that for a given lumen output, CFLs consume approximately up to one-fifth of power of an equivalent ILs which lead to reduction in electricity consumption from the connected electricity grid which predominantly uses fossil fuel for electricity generation. Hence, lesser consumption of electricity leads to reduction in fossil fuel requirement and reduction in greenhouse gas emissions. The validation team reviewed the website of Bachat Lamp Yojna (<http://emt-india.com/BEE-BLY/BhachatLampYojna.pdf>) and finds the website as authentic and credible source being a website of Ministry of Power, Government of India.

In the PoA-DD, it is described that the PP will carry out a series of activities for the purpose of distribution of CFLs in selected areas in India. These activities will result in replacement of ILs with CFLs leading to reduction in electricity consumption from the national grids as explained in the next paragraph. This series of activities is taken up as a 'Programme of Activity' consisting of different Component of Programme of Activities (CPAs). The CPA can be any village, Taluka, Mandal (Mandal refers to a division within a district which constitutes a group of villages), City or District(s), etc. in the country of India.



The proposed CDM PoA reduces consumption of electrical energy from the regional grids of India. The regional grids are dominated by fossil fuel based power plants. The validation team has reviewed the data base published by Central Electricity Authority (CEA) (Ref /41/) and confirmed that the fossil fuel based generation of power in India is approximately 66% of the total generation. CEA is the only authority to publish such data publicly and works under Ministry of Power, Government of India. Thus, the reduction in consumption of electrical energy leads to the reduction of fossil fuel consumption which otherwise would have been consumed. Hence, the project helps in reduction of green house gases, which would have been emitted by the fossil fuel, based power plants connected to grid or planned to be connected in future. Alternately same amount of saved energy would be made available to other consumers in India, since India faces a peak power deficit.

PP has clarified that, as per the applied methodology AMS II C version 13, in case of replacements the lumen output of the distributed CFL will be within -10% to +50% of the lumen output of the replaced IL. Validation team's explanation on this is reported in detail in section 3.6 of this report.

From the description provided in the revised PoA DD, it is noted that the PP has decided to distribute the CFLs free of cost to replace the ILs and for faster penetration of CFLs in the targeted regions. Further, the description in the revised PoA-DD also clarifies that the PP may sale a partial production in retail market also, to meet the working capital gap/operational expenses for the smooth operation and sustenance of the manufacturing facility. The validation team reviewed this and find that the basic intention of the PP is to route 100% production through PoA. However, to meet with the operational expenses, PP may sale the CFLs in the market and hence the emission reduction on account of the CFLs sold in the retail market will not be claimed. The validation of this arrangement and its impact on the additionality has been described more explicitly later in section 3.7.3 of this report.

CAR 16 was raised as in the PoA-DD, the description of the pre-project and the project activity was not transparently described. Supporting documents for a given lumen output of CFLs was not provided, to demonstrate that it consumes up to one-fourth (approx.) of power of an equivalent ILs causing reduction in requirement of electricity from the connected electricity grid. Also, use of 'run meter' was not clearly described for measuring hours. In response to CAR 16, the PP corrected the CFL consumption, as one-fifth of the IL bulb, substantiated by the web link of Bureau of Energy Efficiency (Ref /9/), which clearly describes one-fifth consumption of CFL compared to IL for almost similar Lumen Output. The validation team accepted this due to the fact that the Bureau of



Energy Efficiency is a department of Government of India, hence, validation team finds data published by this is as authentic and closed this point. For the 'run meter' PP has now correctly explained in the PoA DD that same 'run meter' can be used in the same CPA and in other CPAs as well, however, 'running hours of CFLs' can be stored in server. Detail description of this is now provided in section E.6.3 of the PoA-DD. Having reviewed this, validation team closed the CAR.

CL-2 was raised as in the web hosted PoA-DD, the areas where PP is planning to distribute CFLs and its implementation plan was not clearly explained. In response, PP corrected targeted areas and clear description of how these areas can be included in CPAs is now provided in the PoA-DD, hence, CL is closed.

Validation team validated the accuracy of the project description through a combination of steps consisting of review of purchase orders (Ref /13/), which are related to the purchase of machineries for the program activities, validation team's site visit and interviews with the project participant and their representatives.

Based on site visits, document review and interviews conducted, the validation team hereby confirms that the project description in the revised POA-DD (Ref /4/) is accurate and complete in all respects.

3.6 Baseline and monitoring methodology

3.6.1 General Requirements (76-77)

The steps taken to assess the relevant information contained in the POA-DD against each applicability condition are described below.

The proposed CDM PoA titled "Manufacture and Distribution of CFLs in India" uses the previously approved small-scale CDM methodology AMS II C version 13 (Ref /B2/).

Applicability condition 1: *This methodology comprises activities that encourage the adoption of energy-efficient equipment/appliance (e.g., lamps, ballasts, refrigerators, motors, fans, air conditioners, pumping systems) at many sites. These technologies may replace existing equipment or be installed at new sites. In the case of new facilities, the determination of baseline scenario shall be as per the procedures described in the general guidance to SSC methodologies under the section 'Type II and III Greenfield projects (new facilities)'. The aggregate energy savings by a single project may not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies. For fossil fuel end use energy efficient technologies, the limit is 180 GWh thermal per year in fuel input.*



Justification by validation team: The proposed project activity involves distribution of the energy efficient CFLs in identified regions in India to replace or avoid usage of ILs. This will lead to reduction in electricity consumption from the fossil fuel dominant national grids. The project activity is planned in various regions of India. The eligibility criteria described in Section A.4.2.2 of the PoA-DD includes that every CPA in aggregate meets the small-scale or micro-scale threshold criteria and remains within those thresholds throughout the crediting period of the CPA. This will ensure that each CPA being added under the proposed CDM PoA, will be in compliance of the requirement of the applied methodology. Based on the review of the POA-DD, the validation team hereby confirms that the aggregate energy savings by a single project (CPA) may not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies. Further, the proposed CDM PoA will also include installation of CFLs at new sites i.e. empty plug load/holders. The installation of CFLs at new sites will be ascertained by reviewing the baseline survey data during addition of each CPA. For the purpose of validation of real case CPA, two-member validation team visited Gollaguda and confirmed the replacement of all the existing ILs. There are no new sites in the real case CPA being submitted for registration along with CPA. Hence, the above applicability condition is complied with.

Applicability condition 2: *For each replaced appliance/equipment/system the rated capacity or output or level of service (e.g., light output, water output, room temperature and comfort, the rated output capacity of air-conditioners etc.) is not significantly smaller (maximum - 10%) than the baseline or significantly larger (maximum + 50%) than the baseline.*

Justification by Validation team: The total lumen output for the ILs has been referred in the table in Section E.2 of the PoA-DD, where, various ILs are replaced with relevant CFLs as under.

Baseline technology (IL) watt	Minimum Light output of IL as per Indian Standard, IS 418:2004 (in Lumens)	Replaced with corresponding CFL of capacity (Wattage)	Maximum output of CFL as per Indian Standard, IS 15111:2002 (in Lumens)	Max Increase/decrease in Lumens due to replacement of IL with CFL in the PoA
40	345	9	423	22.6
60	620	15	765	23.4
100	1240	20	1120	-9.7



The validation team has reviewed the Indian Standard, IS 418:2004 (Ref /36/) and IS15111 (Part 2): 2002, (Ref /37/) and confirms the lumen output of the IL and CFL with their respective wattages.

Based on the details in the table above, the validation team could ascertain that the service level or output in terms of lumens in the PoA is within the limit of maximum -10% to +50% than the baseline, hence applicability condition 2 is fulfilled and well justified.

Applicability condition 3: *If the energy efficient equipment contains refrigerants, then the refrigerant used in the project case shall be CFC free. Project emissions from the baseline refrigerant and/or project refrigerants shall be considered in accordance with the guidance of the Board (EB 34, paragraph 17). This methodology credits emission reductions only due to the reduction in electricity consumption from use of more efficient equipment/appliances.*

Justification by Validation team: The proposed CDM Project activity does not contain any refrigerant in the project activity. There is a reduction in electricity consumption due to use of more efficient equipment/appliances i.e. replacement of IL with CFL. Hence, this applicability condition is not relevant to the proposed CDM project activity.

Based on the above described assessment, the validation team agrees that the project activity meets all the applicability conditions of the selected approved methodology AMS II.C, version 13.

CL-7 (Point 8) was raised as in the PoA-DD, clear demonstration requirement of energy savings of SSC-CPA not exceeding 60 GWh was not clearly described in the eligibility criteria. The PP in response clarified that, as per the requirement of the methodology, for each CPA, the aggregate energy savings by a single project will not exceed the savings equivalent of 60 GWh per year for electrical end use energy efficiency technologies. This is now included as an eligibility criteria for each SSC-CPA in the generic CPA DD and in the real case CPA DD also for the proposed Programme of Activities. . The electricity saving which is less than 60 GWh is transparently calculated in the Estimated Emission Reduction Sheet of first real case CPA at Village Gollaguda, and thereby closed CL-7.

The validation team noted that the web hosted CPA DD does not include the demonstration of de-bundling in accordance with Annex 13 of EB 54 in a conservative manner. The validation team raised a clarification request CL-24. The project participant revised the CPA-DD and considered the maximum wattages of CFL i.e. 20W for the calculations of the annual

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energy savings by an individual subsystem as required by the paragraph 10 of Annex 13, EB 54. The validation team noted that the maximum annual energy saving by the subsystem i.e. CFL (the saving is worked out as $100\text{W IL} - 20\text{ W CFL} = 80\text{W}$ electricity saved for 3.5 hours¹ a day for 365 days per annum) is 0.000102 GWh, which is equal to 0.000017% of the 60 GWh. Having reviewed the revised CPA_DD, the validation team closed the clarification request, CL-24.

The validation team hereby confirms that the selected baseline and monitoring methodology, AMS II.C, Version 13 is previously approved by the CDM Executive Board, and is applicable to the project activity, which complies with all the applicability conditions therein. The small scale methodology AMS II C version 13 (Ref /B2/) is applied in conjunction with the latest version of General Guidance to SSC CDM methodologies (Ref /B11/).

In order to check the appropriateness and suitability of the applied methodology by the project participant, the validation team also reviewed the methodology AMS II J version 4. After reviewing both the methodology, validation team concluded the following:

The proposed Programme is "Manufacture and Distribution of CFLs in India". The methodology AMS II J is limited to residential sector only, whereas, the proposed program activity involves other sectors also including commercial and industrial as per the decision taken by the management of project participant. The proposed program involves free distribution of CFLs and replaces ILs with CFLs. The PP will also demonstrate in each CPA that in the baseline there would be use of ILs for the future load also (refer applicability condition 1 of AMS II C). In addition, the AMS II J restricts the operating hours up to 5 hours/day (by default 3.5 hours/day), but AMS II C does not restrict operating hours. Since, the programme involves other sectors like commercial and industrial, the restriction of operating hours may not appropriate.

Further, the applied baseline methodology AMS II C requires continuous metering of hours of operation, which will account for accurate emission reduction considering the use of CFLs i.e. in residential/commercial/industrial. Hence, the applied methodology AMS II C is more appropriate to the type of project activity over baseline methodology AMS II J.

¹ Based on the baseline survey carried out by the Project participant



Based on the above assessment, the validation team accepts the use of AMS II C over AMS II J for the proposed PoA.

The validation team hereby confirms that, as a result of the implementation of the proposed CDM project activity, there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

3.6.2 Project boundary (80)

The applied methodology viz; AMS II C, Version 13 describes the project boundary as the physical, geographical location of each measure (each piece of equipment) installed.

The validation team validated the project boundary by assessing that the distribution of CFLs in place of IL would be in the entire host country, India, where CPA can be village or hamlet, Taluka (Locally called Taluk), Mandal or District within the boundary of India.

Thus, the validation team confirms that the project boundary described under Section A.4.1.2 of the revised POA-DD correctly represents the project boundary as mandated by the applied methodology.

CL-6 was raised, as the the physical boundary of India was described by means of map, was not clearly visible. There were differences observed in map of India, the Host country, for CDM-SSC-PoA and and Specific- CPA map. Also, the format of Latitude & Longitued is different in SSC-PoA and SSC-CPA and Specific- CPA. In response to this, the PP corrected the lat-long of India, and for the Specific CPA provided the source for the geo-coordinates hence, the CL is closed.

The validation team confirms that the only greenhouse gas relevant to the project activity is CO₂. This gas is addressed by the applied methodology. Based on the above assessment, the validation team hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

3.6.3 Baseline identification (87-88)

The proposed PoA is the Manufacture and Distribution of the CFL in India, where the CFLs will be distributed free of cost to replace either existing ILs or be installed at plug loads. The project will distribute these CFLs in the residences, commercial buildings industries etc. Plugs where at present no IL(s) is/are used may be covered under the project activity, subject to demonstration by the PP that in the baseline there would have been installation of IL only. This is in accordance with applicability



condition 1 of the methodology. The project activity is classified as an energy efficiency improvement project which is applicable under demand side energy efficiency activities for specific technologies.

The steps taken to assess the requirement given in paragraph 80 and 81 of the VVM are described below:

Validation team assessed the baseline identification done by the project participant using the provisions of the applied methodology. As per the para 5 of applied methodology AMS II C, version 13, "If the energy displaced is fossil fuel based, the energy baseline is the existing level of fuel consumption or the amount of fuel that would be used by the technology that would have been implemented otherwise. The emissions baseline is the energy baseline multiplied by an emission factor for the fossil fuel displaced."

As per para 6, "If the energy displaced is electricity, the emission baseline is determined using one of the two options."

Project Participant has chosen Option 1 to describe the baseline for the project activity, since in the project activity the energy displaced is electricity. The validation team accepted the same since the proposed project activity is "Manufacture and Distribution of CFLs in India". As reported in section 3.6.1 above, the CFLs will be distributed to replace the ILs, or will be installed at new sites. This will result into lesser electricity consumption as compared to the baseline. Thus, due to project activity, there would be displacement of electricity in the project compared to baseline.

In accordance with paragraph 6 of the applied baseline and monitoring methodology AMS II C, version 13, the baseline emission calculations are the baseline energy consumption of equipment/appliance multiplied by an emission factor for the electricity displaced. As per methodology, reliable local or national data for the emission factor shall be used; IPCC default values should be used only when country or project specific data are not available or difficult to obtain. The PP has used emission factor from the CEA data base, which is of national grids of India i.e. country specific national data.

As per AMS II C version 13, the emissions associated with grid electricity consumption should be calculated in accordance with the procedures of AMS-I.D. As per AMS I D, version 17, The PP has calculated the Emission Factor in a transparent and conservative manner. The same can be calculated in either of the following two options:



- (a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system', Version 2.2.1.

OR

- (b) The weighted average emissions (in Kg CO₂/kWh) of the current generation mix. The data of the year in which the project generation occurs must be used.

Project participant has adopted the first option and used the official published data on operating and build margin emission factors (Ref /17/) which is calculated as per the "Tool to calculate emission factor for an electricity system". The version of the CEA database used is Version 4, which is the latest version available at the start of validation. This data is published by Central Electricity Authority (CEA), who is the sole authority for the publication of such data in India. This data is based on Version 1.1. The project participant has used the latest available version (Version 2.2.1) of the tool which indicates in Step 1 that the tool is not applicable in case the project electricity system is located partially or fully in an Annex 1 country. Further it also includes an optional step, Step 2 which provides an option to project participant to exclude off-grid plants in the project electricity system. Since the Indian Electricity system, wherein the proposed project activity is located in, is well defined and is not located partially or fully in any Annex 1 country, the Step 1 of the tool is still applicable to the project activity. Further since step 2 is optional, the project participant have not considered Step 2 in the estimation of the operating margin and build margin, since the CEA database version 4 calculates the values of operating margin and build margin considering data for grid power plants only. Hence CEA database can still be used. Project participant has applied weight factors for the OM and BM [50% & 50% respectively] as specified in the tool to arrive at the emission factor for the combined margin. The years considered for OM are 2005-06, 2006-07, 2007-08 and for the BM it is 2008-09, which is the most recent data available to PP. Since, the PoA is planned to be implemented nationwide i.e. in the whole country of India, which has 2 national grids viz; (1) Southern Grid and (2) NEWNE grid, the PP has correctly calculated two combined margin emission factor that is one value for Southern Grid and another for NEWNE grid. This works out to be 0.8557 tCO₂/MWh for Southern grid and 0.8031 tCO₂/MWh for NEWNE grid. Being a nationwide PoA, as clarified by PP, and having reviewed the calculation of emission factor, validation team agrees to these 2 values of respective national grid and accepts the values calculated by the PP, which are in accordance with Tool to calculate emission factor of an electricity system.



In order to check that in the baseline the PP could have manufactured and distributed the ILs in India, the validation team referred following documents from the third parties, which are publicly available sources.

- 1) <http://www.worldwatch.org/node/6438>

The validation team noted from the above web link that Ajay Mathur, (Director General of the Bureau of Energy Efficiency (BEE)), stated "Almost half the households in India will immediately benefit from the scheme (BLY scheme), and as other areas get electrified, those villages will get added on." BEE is the Indian government agency responsible for various energy efficiency measures undertaken in the host country both in residential or commercial sectors. One of such measures is also a CDM project activity vide UNFCCC registration no. 3223. Thus, it is evident that there is a significant scope of CFL penetration in an already established market of IL.

Further to this, the website also describes that in 2008, 734 million incandescent lamps were sold in India, whereas CFL sales were only 199 million. The combined penetration share of incandescent lamps for lighting in the commercial and residential sectors was nearly 80 percent.

In order to cross check the information on penetration on CFLs in India and hence, dominance of ILs over CFLs, validation team also reviewed the following website, which is a publicly available, third party document.

- 2) <http://www.indg.in/rural-energy/policy-support/bachat-lamp-yojana>

It states "Statistics by lighting association indicates that the penetration of CFLs in household sector is only about 5% - 10%. The relatively low penetration rate is largely due to the high price of the CFLs, which costs 8-10 times as much as incandescent bulbs." The presentation of ELCOMA (as discussed below), indicates that CFL contributes only 10% in power consumption for lighting in India.

In addition to the above assessment, validation team also referred to other credible documents available publicly. This assessment was to confirm the viability of the baseline scenario with respect to its existing as well as future market in India. The validation team reviewed a set of guidelines issued by Central Pollution Control Board in November 2008. As per the guidelines of the Central Pollution Control Board, the lighting industry in India has an annual growth of about 12% per annum in the last 4 years. The same report further iterates that Incandescent lamp (GLS) production has increased by more than 20% during year 2006. It is also further estimated that the luminaries market has been growing at least 25 to 30% per annum for the last two years.



The validation team has reviewed a presentation of Secretary General of

Electric Lamp and Component Manufacturers' Association of India (ELCOMA²). The electric lamps and components manufacturers in India founded "Electric Lamp and Component Manufacturers Association of India" (ELCOMA), representing the entire lighting industry of India. The main purpose of ELCOMA was to establish liaison with government bodies and to support the manufacturers in matters connected with lighting industry. The presentation clearly indicates a growth of lighting industry in India as whole to the tune of 43% (approximately) from the year 2005 to 2008. It also states that the market of ILs has grown from 662 million bulbs in year 2003 to 735 million bulbs in year 2008. Further, as per the details produced by ELCOMA on their website, there is a market / sales of ILs to the amount of 757 million bulbs even in year 2011. This is significantly higher than the production capacity of the baseline plant under consideration.

Having reviewed these third party documents and assessment of the data available, which are publicly available, the validation team accepts that the penetration of CFLs in India is very low. There is no restriction of manufacture and distribution of IL in India and identification of baseline scenario is appropriate and well justified. Hence, the PP could have adopted baseline option instead of Proposed Programme of Activity.

It is noted that the selected baseline scenario is in line with the selected approved methodology. Validation team therefore confirms that the selected baseline scenario reasonably represents what would happen in absence of the proposed CDM POA project activity

Based on the above assessment, the validation team hereby confirms that:

- a) All the assumptions and data used by the project participants are listed in the POA-DD, including their references and sources;
- b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- d) The investment in the proposed project activity is not a mandatory obligation on any project owner in India. The validation team confirms this from the local sectoral knowledge and from the observation of use of ILs in the first CPA of the PoA.

² <http://www.elcomaindia.com/>



- e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.6.4 Eligibility Criteria for CPA to be included in PoA (166-167)

In accordance with the EB 55, Annex 38 and as per guidance of EB 63, Annex 3, the PP has described the Eligibility Criteria for CPA to be included in PoA, which is validated by the validation team as under:

Minimum eligibility criteria as per EB 65, Annex 3, Para 14	Validation of eligibility criteria included in the PoA-DD for inclusion of the CPA
a) The geographical boundary of the present CPA including any time-induced boundary is consistent with the geographical boundary set in the PoA	<p>Eligibility Criteria: The CFLs should be distributed in an area within the physical boundary of India.</p> <p>Validation Justification: The physical boundary of the PoA is identified as entire Host country i.e. India. The CFLs under each CPA will be distributed within India. The eligibility criteria mentioned above for geographical boundary is well justified and acceptable.</p>
b) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo);	<p>Eligibility Criteria: In order to avoid double counting the CFLs manufactured by BGPL would have a unique identification number in a format of "CPA Name, XXXX³".</p> <p>Validation Justification: The PP has defined mechanism for unique identification number for each CFL which will be distributed in the CPA. Based on this, the double counting can be avoided, hence, acceptable.</p>
c) The specifications of technology/measure including the level and type of service, performance specifications including compliance with	<p>Eligibility Criteria: All the CFLs manufactured by BGPL will follow standard certification (IS: 15111) and the level of service will be -10% to +50 % of the IL according to</p>

³ This would be a number, which will be identified by the PP.



testing/certifications; hence acceptable.	methodology AMS-II C version 13. Validation Justification: The validation team reviewed the requirement of IS 15111 (Part 2):2002. The CFLs manufactured by the BGPL adheres to the requirement of the standard. Also, validation team reviewed the test certificate submitted by the PP. The testing was carried out by National Physical Laboratory. The validation of service level output as -10% to +50% in accordance with the applied methodology has been validated in section 3.6.1 above. Validation team accepts this eligibility criteria.
d) Conditions to check the start date of the CPA through documentary evidence	Eligibility Criteria: The start date of the CPA will be later than 10th April, 2010 ⁴ . The documentary evidence provided for the start date of the CPA would be a through a production plan released to the concerned department of BGPL. Validation Justification: The start date of CPA can't be prior to the start date of PoA. The eligibility criteria require to check start date of each CPA with reference to start date of PoA i.e. 10/04/2010 as validated below in section 3.7.1. This will be cross checked with documentary evidence at the time of CPA addition into PoA, hence, appropriate and well justified.
e) Conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies applied by CPAs	Eligibility Criteria: The CPA will be eligible for inclusion if the applicability criteria as per methodology is satisfied as mentioned in the section E.2 Validation Justification: The

⁴ http://cdm.unfccc.int/Reference/Procedures/PoA_proc01.pdf



	validation team has validated the applicability conditions in section 3.6.1 above. The same applicability conditions of the applied methodology will also be validated during addition of each CPA, which is acceptable.
f) The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality (please refer to the latest approved version of the Standard for demonstration of additionality of a programme of activities.)	<p>Eligibility Criteria: The PP intends to demonstrate the additionality at the PoA level. Demonstration of additionality for individual CPA is not carried out according to EB-65, Annex 3</p> <p>Validation Justification: The PP has carried out additionality at the PoA level, this is appropriate as per the guidance of EB 60, Annex 26, Para 4, which states “full additionality assessment is not required in the context of component project activities (CPA), rather the confirmation of additionality for CPAs should be conducted by means of the eligibility criteria.”</p> <p>Also, as per EB 65, Annex 3, “PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities. Accordingly, PP has demonstrated additionality based on attachment A of Appendix B of the simplified modalities and procedures for small-scale CDM project activities, hence, appropriate.</p>
g) The PoA-specific requirements stipulated by the CMEs including any conditions related to undertaking local stakeholder	Eligibility Criteria: The project participant (BGPL) has stipulated that since the project involves manufacturing and distribution of



consultations and environmental impact analysis.	<p>CFLs, local stakeholder consultation and environmental impact analysis has been carried out at PoA level. Further explanation on local stakeholder consultation and environmental impact analysis is given in section D of PoA DD.</p> <p>Validation Justification: As per the PoA-DD guidance, choice of the local stakeholder consultation and environmental impact analysis has been justified in the PoA-DD. The PP has explained the same in relevant section D.1 and C.1 of the PoA-DD. The same is explicitly justified by the validation team in section 3.10 and 3.11 of the validation report hereafter, hence, acceptable</p>
h) Conditions to provide an affirmation that funding from Annex I parties, if any, do not result in a diversion of official development assistance.	<p>Eligibility Criteria: There is no funding from Annex-1 parties for the PoA as a whole. Evidence for investment and loan has been shown to DOE</p> <p>Validation Justification: The validation team reviewed the loan application for the proposed CDM-PoA from PP to the State Bank Of Hyderabad dtd. 09/02/2008 for the proposed PoA (Ref /23/) and Loan sanction letter from the State Bank of Hyderabad vide its letter no. F/ADV/Balaji Greentech/8 dtd. 16/04/2008 (Ref /24/), having reviewed these validation team confirms that there is no funding from Annex-1 parties for the PoA as a whole.</p>
i) Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution	<p>Eligibility Criteria: The target group in the project activity is residential, commercial, industrial identified from the electricity meter no/ service no. The distribution</p>



mechanisms (e.g. direct installation)	<p>mechanism is replacement of IL with CFL or avoidance of IL with same service level as described in the methodology AMS-II C version 13</p> <p>Validation Justification: As described in the PoA-DD there would be different target groups like residential, commercial, industrial etc. In the first real case CPA, baseline survey for the entire CPA is carried out and number of operational hours for the real case CPA identified is 3.5 hours (there being 129 households and only 2 shops), this is in line with foot note no.5 of the EB 65, Annex 3 hence, acceptable.</p>
j) Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys	<p>Eligibility Criteria: An illustration of sampling in accordance with EB-65 annex-2 is explained in detail in section A.4.4.2 of the PoA DD which is applicable to all the CPA included in the PoA. Baseline survey would be carried for each CPA. The same is explained in section A.4.2 of the PoA. Each CPA to be included in the PoA will follow the same sampling and surveying procedure mentioned in the PoA DD section A.4.2.</p> <p>Validation Justification: The sampling requirements have been described in the PoA-DD in section A.4.4.2. The CPA would follow the same. The sampling is carried out in accordance with EB 65, Annex 2 and EB 50, Annex 30. The same is validated in Section 3.8 further in this report, hence, acceptable.</p>
k) Where applicable, the conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria (please refer to the latest	<p>Eligibility Criteria: Each CPA in aggregate meets the small scale threshold as mentioned in the methodology. This would be demonstrated in the emission</p>



<p>approved version of the Guidelines for demonstrating additionality of micro-scale project activities and the latest approved version of the General Guidelines to SSC CDM methodologies and remain within those thresholds throughout the crediting period of the CPA- (Project participant will demonstrate threshold criteria based on small scale)</p>	<p>reduction spreadsheet.</p> <p>Validation Justification: The validation team validated the algorithm in section 3.6.5 of this report. The same algorithm has been used by the PP to estimate the emission reduction in the first real case CPA. The PP has submitted the emission reduction spread sheet (Ref /19/). Validation team reviewed the same and finds that the electrical energy savings in first real case CPA is 0.018229 GWh per annum which is less than 60 GWh as specified by the latest approved version of the General Guidelines to SSC CDM methodologies. The electrical energy saving would be cross checked with the emission reduction calculation spread sheets at the time of each CPA addition throughout entire crediting period.</p>
<p>l) Where applicable, the requirements for the de-bundling check, in case CPAs belong to small-scale (SSC) or micro-scale project categories (please refer to the latest approved version of the Guidelines on assessment of de-bundling for SSC project activities.)</p>	<p>Eligibility Criteria: It will be checked that the SSC-CPA is neither registered as an individual CDM project activity nor included as a CPA of another registered PoA involving energy efficient lighting initiatives. Each SSC-CPA will demonstrate that the de-bundling criterion is as per the guideline.</p> <p>Validation Justification: The validation team will cross verify the details of proposed SSC-CPA to be added in the PoA from the UNFCCC website and other publicly available sources to ensure that the proposed SSC-CPA is neither registered as an individual CDM project activity nor included as a CPA of another registered PoA involving energy efficient lighting initiatives. This is an appropriate criteria to ascertain the registration/non-registration of</p>



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	<p>the SSC-CPA being added to the PoA at the time of inclusion of CPA in the PoA during validation.</p> <p>The validation team will assess the de-bundling criteria of the SSC-CPA being added to PoA in accordance with latest approved version of the Guidelines on assessment of de-bundling for SSC project activities.</p>
m) For CPA(If CFLs are distributed for free of cost, the CPA will be automatically considered to be additional)	<p>Eligibility Criteria: It will be checked that in the SSC-CPA the CFLs are distributed free of cost to confirm that the CPA is 'additional'.</p> <p>Validation Justification: The validation team will verify the details of free distribution of CFLs. The free distribution can be checked during the site visit by interviewing beneficiaries i.e. end-users and by means of identifying the <u>freely distributed</u> project equipment (CFL) as per the unique identification number given to each CFL. <u>Such unique identification number would not exist on the "sold" CFLs by the same CME.</u> This would be cross verified from the documentary evidence(s) i.e. Plant records and with the 'production schedule' released by the Director and from the P & L and balance sheet of the PP, whichever is available.</p> <p>As the PP has demonstrated additionality based on 'free distribution' against sale of IL at INR 15, and hence, is financially more viable option while comparing with 'Free distribution of CFLs', validation team confirms that 'additionality' criteria is an acceptable criteria for registration/non-registration of the SSC-CPA being added to the PoA at</p>



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	the time of inclusion of CPA in the PoA during validation, in line with EB 55, Annex 38 Para 6 (e).
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Based on the above assessment the validation team is of the opinion that the eligibility criteria defined in the PoA-DD are in accordance with the requirements laid down in Para 4 of EB 65, Annex 3. Further, the eligibility criteria defined above are verifiable and DOE can determine that the eligibility criteria are sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs, which is in accordance with EB 65, Annex 3 para 15 and 16. For the real case CPA i.e. "Gollaguda", the validation of eligibility criteria has been reported by validation team in the CPA validation report - Section 3.6.

The eligibility criteria to include particular CPA in PoA were defined in the webhosted PoA DD. However, during the course of validation new guidance has been published by CDM EB. Accordingly, the PP has revised and corrected the eligibility criteria in accordance with EB 65, Annex 3, which is acceptable.

CL 10 was raised since the procedure to avoid double counting and record keeping procedure for each CPA was not clearly explained in the PoA. The Project Participant has now included the description correctly and appropriate to the type of project and hence the CL 10 was closed.

In conclusion, the validation team confirms that eligibility criteria now described in the PoA DD are as per the requirement of EB 55, Annex 38 and in line with EB 65 Annex 3. The same is validated in accordance with VVM Para 166-167.

3.6.5 Algorithms and/or formulae used to determine emission reductions (92-93)

Values fixed ex-ante for the PoA⁵

 $EF_{CO_2,ELEC,y}$

= Emission factor in year y calculated according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1 using the CEA emission data (version 4.0) (Ref /17/)
 = 0.8557 (for the southern grid)
 = 0.8031 (for the NEWNE grid)

Supprimé: IE_{IL}

Supprimé: =

Supprimé: Electricity imported from grid for manufacturing of one IL, kWh,

Supprimé: =

Supprimé: 0.207 kWh per lamp

⁵ Detailed source for the value of parameters is given in this section of the report later



Supprimé: 02

The steps taken to assess the requirement outlined in paragraph 88 of the VVM are described below:

The proposed PoA is the Manufacture and Distribution of CFLs in India, where the CFLs will be distributed free of cost to replace either existing ILs or be installed at plug loads. The project will distribute these CFLs in the residences, commercial buildings industries etc. Plugs where at present no IL(s) is/are used may be covered under the project activity, subject to demonstration by the PP that in the baseline there would have been installation of IL only. The project activity is classified as an energy efficiency improvement project which is applicable under demand side energy efficiency activities for specific technologies. The PoA correctly applies the methodology AMS II C version 13, as validated in section 3.6.1 above.

As defined in [Para 6 of AMS II C, Version 13](#), for energy efficiency projects, the energy baseline is the technical energy loss within the project boundary calculated using one of the two options, [in case the energy displaced is electricity, viz;](#)

Option 1: The product of the baseline energy consumption of equipment/appliances and the emission factor for the electricity displaced.

Option 2: The specific energy consumption of the system in the baseline times the output in project year y times the emission factor for the electricity displaced. This option can only be used where comparable conditions for the output in the baseline and project can be established. For example in the specific case of a water pumping system comparable conditions can be established by one of the options below:

Supprimé: $Q_{IL,propane}$

Supprimé: =

Supprimé: Quantity of propane used for manufacturing one IL, $t_{C_3H_8}$

Supprimé: =

Supprimé: 0.015 kg of propane per lamp

Supprimé: $EF_{propane}$

Supprimé: =

Supprimé: Emission factor of propane, $t_{CO_2}/t_{C_3H_8}$. The emission factor of propane considered is 3. (1 mole of propane when combusted emits 3 moles of CO_2 . Hence, as the molecular weights of propane and Carbon Dioxide are same, 1 kg of propane when combusted will emit 3 kg of CO_2 .)

Supprimé: =

Supprimé: 3%

Supprimé: $Q_{IL,diesel}$

Supprimé: =

Supprimé: Quantity of diesel used in DG set in litre

Supprimé: η_{diesel}

Supprimé: =

Supprimé: Density of diesel, kg/l = 0.83 kg/l

Supprimé: NCV_{diesel}

Supprimé: =

Supprimé: Net calorific value of diesel, kcal/kg

Supprimé: =

Supprimé: 43 kcal/kg

Supprimé: EF_{diesel}

Supprimé: =

Supprimé: 74.1 tCO₂/TJ

Supprimé: provided

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- i. Show that average baseline water flow rate (discharge) is within +/- 10% of the flow rate during the project;
- ii. Choose the nameplate head and discharge specifications of the baseline pump and corresponding power/energy consumption (weighted average values can be used when pumps are operated in parallel) for a conservative estimate of EER

Of the above two options, the PP has opted option 1. The proposed CDM PoA involves manufacture and distribution of CFLs in India and [the CFLs](#) will be installed at the already existing plugs of ILs or new sites considering use of IL as a baseline scenario, which will be confirmed by reviewing the baseline survey at the time of CPA addition. Thus, the project activity will lead to the replacement of ILs (devices) with CFLs and there is not any retrofitting. Since, there is [a](#) displacement of electricity due to the CDM PoA, option 1 selected by PP is appropriate [and well justified](#).

The methodology prescribes the algorithm to be used for the baseline emission calculations for the option-1 [in Para 6](#). The Project Participant has applied the same correctly in section E.6.2 in the PoA-DD, as described below.

Baseline emission ([Emissions due to power consumption by incandescent lamps installed at the user end in the baseline](#))

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$$BE_y = E_{BL,y} * EF_{CO2,ELEC,y} + Q_{ref,BL} * GWP_{ref,BL}$$

Supprimé: +

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y)$$

Where parameters are identified as follows in the methodology and POA-DD:

Parameter	Description
BE_y	Baseline emissions in year y (tCO ₂ e)
$E_{BL,y}$	Energy consumption in the baseline in year y (kWh)
$EF_{CO2,ELEC,y}$	Emission factor in year y calculated in accordance with the provisions in AMS-I.D (tCO ₂ /MWh)
Σ_i	Sum over the group of "i" devices (e.g., 40W incandescent bulb) In this PoA it is no. of Incandescent bulbs replaced, for which the project energy efficient equipment is operating during the year, implemented as

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	part of the project activity
n_i	Number of devices of the group of "i" devices (e.g., 40W incandescent bulb) replaced, for which the project energy efficient equipment is operating during the year
p_i	Power of the devices of the group of "i" baseline devices (e.g., 40W incandescent bulb). In the case of a retrofit activity, "power" is the weighted average of the devices replaced. In the case of new installations, "power" is the weighted average of devices on the market
o_i	Average annual operating hours of the devices of the group of "i" baseline devices. This is based on sampling as explained in this section later. (See 'sampling')
l_y	<p>Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country.</p> <p>This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant.</p> <p>A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.</p>
$Q_{ref,BL}$	<p>Average annual quantity of refrigerant used in the baseline to replace the refrigerant that has leaked (tonnes/year). Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used. → This is not applicable, as there is no refrigerant used in the proposed CDM PoA.</p>
$GWP_{ref,BL}$	Global Warming Potential of the baseline refrigerant (t CO ₂ e/t refrigerant) → This is not applicable, as there is no refrigerant used in the proposed CDM PoA.

Supprimé: As reported in section 3.6.3 above, the baseline scenario of the project scenario involves manufacture and sale of ILs (distribution) and though not provided in the methodology, the validation team is of the opinion that the baseline emissions, project emissions and leakage emissions with respect to the manufacturing activity of the IL should be considered while calculating emission reduction. This will be compared with the respective emissions of the manufacturing activity of CFLs i.e. project. Hence, the PP has provided the equations which are appropriate for calculating the GHG emissions due to manufacture of IL and CFLs. The validation of these algorithms is described as under. ¶

¶ The manufacturing activity of ILs leads to the GHG emission by use of Grid electricity, diesel and propane. In addition, baseline emissions also involve use of ILs, which is also accounted hereunder in accordance with methodology. Thus, total baseline emissions consist of: ¶

¶ Power consumption (use of grid electricity) in manufacturing process of ILs ¶
 ¶ Consumption of Propane in manufacturing of ILs ¶
 ¶ Consumption of Diesel in manufacturing of ILs ¶
 ¶ Grid electricity consumption by the end users due to ILs. ¶

¶ **Emissions due to power consumption in manufacturing process of ILs: ¶**

¶ $BE_{IL,gridelec} = IE_{IL} * EF_{CO2,ELEC,y}$ ¶
 where ¶
 $BE_{IL,gridelec}$... [1]

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Supprimé: Emissions due to power consumption by incandescent lamps installed in the baseline. ¶



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Hence, the baseline consumption of electricity by ILs and the emission factor of the grid is as per following for the proposed:

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$$BE_y = E_{BL,y} * EF_{CO_2ELEC,y} \quad \text{From the Equation (1) of the methodology}$$

Where,

- BE_y = Baseline emissions in year y (tCO₂e)
 $E_{BL,y}$ = Energy consumption in the baseline year y (kWh)
 $EF_{CO_2,ELEC,y}$ = Emission factor in year y calculated according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1 using the CEA emission data (version 4.0) (Ref /17/)
 = 0.8557 (for the southern grid)
 = 0.8031 (for the NEWNE grid)

The energy consumption in the baseline year can be calculated as follows:

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y) \quad \text{Equation (2) of the methodology}$$

Where,

- \sum_i = Sum over the group of "i" bulbs (e.g. 40W, 60W ILs) replaced or avoided by usage of CFL which is operating during the year implemented as part of the project activity
 n_i = Number of ILs in each group "i" (e.g. 40W IL) replaced or avoided by installing CFLs (From the baseline survey data of CPA (Ref /18/))
 p_i = Power of the ILs of the group of "i" (e.g. 40W IL). (From the baseline data of CPA (Ref /18/))
 o_i = Average annual operating hours of the ILs of the group of "i" (From the baseline data of CPA (Ref /18/ for baseline data)).
 l_y = Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction.
 = 0.1 (default)
 [In the calculation of the baseline and project emissions during the crediting period, if any recent data is available for the grid in the SSC-CPA region for technical losses in the grid, the same would be used. In the absence of availability of such data, the project participant intends to use the default value of 0.1.]

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Validation justification for the sources of values used in baseline algorithms:

It would be worthwhile to mention here that the PP has appointed a third party firm, viz. M/s. Nagabhushan & Company to conduct a pre-feasibility report for baseline scenario i.e. Manufacture and distribution (sale) of ILs in India on 21/11/2007, i.e. prior to the decision making i.e. 20/03/2008. Thus, pre-feasibility report was available with the PP at the time of decision making. While estimating emission reduction, the PP has referred the input values from this pre-feasibility report. In accordance with Para 62 of VVM 1.2, the validation team conducted a visit on 02/08/2011 and 03/08/2011 to interview personally M/s. Nagabhushan & company for the validation of the process of preparation of pre-feasibility report and its input values. The validation team interviewed Mr. B. Nagabhushan, who represents M/s. Nagabhushan & Company, the Chartered Accountancy firm. It was noted that, Mr. Nagabhushan is a Chartered Accountant, who carries out work of Technical Economic Viability Report for various projects. He is also empanelled as an expert in various nationalized banks. These banks, while sanctioning loans for various projects, seeks advice/opinion from Mr. B. Nagabhushan, who after studying the project report, gives inputs/opinion to the bank about projects' viability. Hence, inputs from M/s. B. Nagabhushan & Co, becomes vital in sanctioning of loans for various projects. Further, Mr. B. Nagabhushan also confirmed his appointment by the project participant for Pre-feasibility report of the baseline scenario. As reported by B. Nagabhushan, the input values were considered based on the proposals from the suppliers and contractors for IL manufacturing facility. The validation team cross checked the values from these proposals and confirm that the input values considered are correct and from the most relevant sources, hence appropriate and well justified.

It was clarified by Mr. B. Nagabhushan that while studying and carrying out pre-feasibility study, M/s. B. Nagabhushan & Co referred qualified technical personals in the relevant field; to review the technical matters. Technical help related to plant and machineries were sought from Mr. G. Ashokkumar, a professional having 25 years of experience in Andhra Pradesh State Finance Corporation, India and working as independent consultant for the past 10 years. Based on G. Ashokkumar's inputs; M/s. B. Nagabhushan & Co. prepared a Prefeasibility Report for Manufacture and distribution of Incandescent Lamp in India (Ref /14/).

Based on the background investigation of the pre-feasibility report, the validation team accepts the values from these reports for the calculations of the baseline emissions. Cross checking of this report was done by means of quotations provided by the technology supplier during

Commentaire [b1]: Here onwards there is a repetition. Can we conclude by writing a consolidated equation based on equation 1 and 2 of methodology.

Supprimé: Total baseline emissions due to manufacturing and distribution (sale) of ILs:

$$BE_{y, total} = BE_y + \sum_i n_i \times (BE_{IL, gridlect} + BE_{IL, prop})$$

The baseline consumption of electricity by ILs and the emission factor of the grid:

$$BE_y = E_{BL,y} * EF_{CO_2 ELEC, y}$$

From the Equation (1) of the methodology

Where,

BE_y

[2]

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preparation of the pre-feasibility reports, the BEE project (Ref /09/) and basic engineering formulae.

Project Emission (Emissions due to power consumption by CFLs installed in the project at the user end)

The methodology prescribes the algorithm to be used for the project emission calculations as per equation 5 of applied methodology. The Project Participant has applied the same correctly in section E.6.2 in the PoA-DD, as described below:

As per equation 5 & 6 of methodology...

$$PE_y = EP_{PJ,y} * EF_{CO2,y}$$

and

$$EP_{PJ,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y)$$

Where parameters are identified as follows in the methodology and POA-DD:

Parameter	Description
PE_y	Project emissions in year y (tCO ₂ e)
$EP_{PJ,y}$	Energy consumption in project activity in year y . This shall be determined <i>ex post</i> based on monitored values
$EF_{CO2,ELEC,y}$	Emission factor in year y calculated in accordance with the provisions in AMS-I.D (tCO ₂ /MWh)
$\sum i$	Sum over the group of " i " devices (e.g., 9W CFL) In this PoA it is no. of CFL, operating during the year, implemented as part of the project activity
n_i	Number of devices of the group of " i " devices (e.g., 9W CFL), operating during the year
p_i	Power of the devices of the group of " i " project devices (e.g., 9W).
o_i	Average annual operating hours of the devices of the group of " i " project devices. This is based on sampling as explained in this section later.(See 'sampling' reported later)
l_y	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The

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	<p>average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country.</p> <p>This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant.</p> <p>A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.</p>
$Q_{ref,BL}$	<p>Average annual quantity of refrigerant used in the project scenario to replace the refrigerant that has leaked (tonnes/year). Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used. → This is not applicable, as there is no refrigerant used in the proposed CDM PoA.</p>
$GWP_{ref,BL}$	<p>Global Warming Potential of the project scenario refrigerant (t CO₂e/t refrigerant) → This is not applicable, as there is no refrigerant used in the proposed CDM PoA.</p>

Thus, the project emissions can be calculated using following equations.

$$PE_y = EP_{PJ,y} * EF_{CO_2,y}$$

where

- $E_{PJ,y}$ = Energy consumption by CFLs in year y. This shall be determined *ex post* based on monitored values
- $EF_{CO_2,y}$ = Emission factor in year y calculated according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1 using the CEA emission data (version 4 .0) (from CEA database Ref /16/)
- = 0.8557 (for the southern grid)
- = 0.8031 (for the NEWNE grid)

The energy consumption by CFLs can be calculated as:

Supprimé: The manufacturing activity of CFLs (i.e. project activity) leads to the GHG emission by use of Grid electricity, diesel, and propane. In addition, project activity emission also involves use of CFLs, which is also accounted hereunder in accordance with methodology. Thus, total project emissions consist of:

¶ <#>Power consumption (use of grid electricity) in manufacturing process of ILs¶

¶ <#>Consumption of Propane in manufacturing of ILs¶

¶ <#>Consumption of Diesel in manufacturing of ILs¶

¶ <#>Grid electricity consumption by the end users due to ILs.¶

¶ <#>Emissions due to power consumption in manufacturing process of ILs.¶

¶ $BE_{CFL,gridelec} = IE_{CFL} * EF_{CO_2,ELEC,y}$ ¶

¶ Where, ¶

$BE_{CFL,gridelec}$

... [3]

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Supprimé: Emissions due to power consumption by CFLs installed in the project.¶

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Supprimé: $PE_y = EP_{PJ,y} * EF_{CO_2,ELEC,y}$

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Supprimé: $EF_{CO_2,ELEC,y}$

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$$EP_{PJ,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y) \quad \text{of methodology}$$

Where,

 p_i = Power of the CFLs of the group of "i" (9/11/20 Watt CFL). n_i = Number of CFLs of group "i" (9/15/20 Watt CFL) o_i = Average Annual Operating hours of CFLs of group "i" (9/15/20 Watt CFL) l_y = Annual average technical grid lossSupprimé: $E_{PL,y} = \sum_i (n_i * p_i)$

Supprimé: Equation (2)

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Leakage:

The methodology states that if the energy efficiency technology is equipment transferred from another activity, leakage is to be considered.

In the present Project activity titled "Manufacture and distribution of CFLs in India", the energy efficiency technology equipment (i.e. CFLs) is not transferred from another activity. Manufacturing of CFLs was confirmed by the validation team during site visit on 25/05/2010 and 26/05/2010 at the plant i.e. at Nandikandi village of Medak district by observing 2 lines of manufacturing the CFLs and from the purchase orders of these machines (Ref /13/), hence validation team confirms that there is no leakage expected due to the proposed programme of activity.

Supprimé: Total project emissions . =
 $PE_{y, total} = PE_y +$

$$\sum_i n_i \times (PE_{CFL, gridelect} +$$

Supprimé: replacement of CFLs in lieu
of ILs in the baseline.

In the PoA-DD, the PP has clarified that the leakage is avoided by collecting the replaced ILs. Adequate records will be maintained for the collected ILs. It is clarified in the PoA-DD that the disposal of the ILs will be done as per the standard practice available at the time of disposal or suggested by any concerned regulatory, for which adequate records will be maintained and made available to the DOE during verification.

The emission reductions will be calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

where,

 ER_y = emission reductions from the project activity BE_y = Baseline emissions in year y PE_y = project emissions from the project activity LE_y = leakage emissions from the project activity

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Conclusion:

Baseline information pertaining to grid emission factor has been provided by the PP in the Annex 3 of the PoA-DD, validated by the validation team. The data used in Annex 3 is published by CEA (Ref /16/)



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The detailed algorithms for calculating the baseline emissions, project emissions and leakage emissions are transparently described under sections E.6.2 of the revised PoA-DD (Ref /4/)

The validation team has assessed the calculations of the estimated Emission Reductions as provided by project participant in a spreadsheet (Ref /19/).

CAR-13 was raised as the validation team was of the opinion that the calculation of emission reduction was not correct, as it did not consider the emissions due to manufacturing of CFLs, including grid electricity consumption, propane, consumption and diesel used in DG set in case of exigency. In response to CAR-13, the project participant has clarified that the applied baseline methodology considers emission of CO2 only due to project equipment, which is CFL, which has replaced the ILs. The emission reduction is attributable only to CFLs, which replace ILs. Hence, the PP has considered emissions only due to displaced electricity. The validation team referred baseline methodology and accepted this. Hence, the emission reductions in the real case CPA (16 tCO2e/annum) are found to be correct, hence, closed the CAR-13. However, in order to be realistic and fair in calculation of emission reduction, validation team finds that if the consumption of propane gas and electricity in CFL manufacturing are considered as 'emission' sources, the emissions due to this are less than 1% of total emission reduction, which has no material impact, and hence, it can be neglected in accordance with Para 77 of the VVM, version 01.2.

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Supprimé: revised the calculations of emission reduction which now include the emissions due to manufacturing of CFLs, including grid electricity consumption, propane, consumption and diesel used in DG set in case of exigency. However, the emissions in baseline scenario due to operation of the IL manufacturing facility are also considered in baseline emissions. Validation team reviewed baseline emission calculations based on pre-feasibility report (Ref /14/) and project emission from the TEVR (Ref /15/) and confirms that the values used in baseline and project emissions and

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Based on the above assessment, the validation team hereby confirms that:

- All assumptions and data used by the project participants are listed in the PoA-DD, including their references and sources;
- All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the POA-DD;
- All the values used in the PoA-DD are considered reasonable in the context of the proposed CDM project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and total emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PoA-DD.

3.7 Additionality of a project activity (97)

The proposed CDM PoA is a small scale project activity as per the classification of type II small scale projects provided in General Guidelines to SSC CDM methodologies (Ref /B11/) provided by CDM-EB.



The additionality of the proposed CDM PoA has been demonstrated at the PoA level only as a full additionality assessment is not required in the context of component project activities (CPA), rather the confirmation of additionality for CPAs should be conducted by means of the eligibility criteria in accordance with Para 4, EB 60, Annex 26. The additionality of proposed project activity is demonstrated at the PoA level as per Attachment A to Appendix B of Simplified modalities and procedures and guidance given vide Annex 21 of EB-65 (Ref /B7/).

The steps taken and sources of information used, to cross-check the information contained in the PoA-DD on this matter are described below. The validation team to assess the additionality of the project activity include review of documents indicated in the assumptions in the financial working excel sheet (Ref /20/). The detailed steps are described in Sections 3.7.1 through 3.7.5 below.

3.7.1 Prior consideration of the clean development mechanism (104)

The proposed CDM PoA involves manufacturing and distribution of CFLs in India. The project implementation was identified by physical inspection during site visit and purchase orders for plant and machineries, civil and electrical work contract, land purchase agreement, etc. The validation team has confirmed the implementation of the manufacturing plant by reviewing the production reports (Ref /42/).

The start date of the proposed CDM PoA is 16/04/2008. The validation team has validated the project activity start date as per following table:

Start date of the CDM PoA project	Justification of and evidences (references) on the starting date of project
16/04/2008	Date of purchase order for the plant and machineries issued to M/s. Precision Engineering Works (Ref /13/) has been reviewed. The purchase order was issued on the 16/04/2008. It is the earliest date at which first real action of the proposed CDM project activity begun. The validation team validated the same from the document viz; PO wherein the project participant had placed the purchase orders for installation of plant and machineries for CFL manufacturing. Hence the validation team concludes that the start date is in accordance with the definition in "Glossary of CDM terms" and CDM VVM (§97) and in accordance with Annex 13 of EB-62.



From above table, the validation team was able to verify that the start date of the CDM-PoA determined, as 16/04/2008 is appropriate and correct.

As reported above, the starting date of the project activity is 16/04/2008, which is before 2nd August 2008. Hence, in accordance with Para 6 (a) and 6 (b) of the Guidelines of the Demonstration and Assessment of prior consideration of the CDM i.e. Annex 13 of EB-62, the project participant has demonstrated that the CDM was a decisive factor to proceed with the project activity and real and continuing actions were taken to secure CDM status of the proposed project activity in parallel with its implementation.

The manner in which the validation team validated the awareness of CDM and serious consideration of CDM in accordance with Para 6 and Para 8 of the Annex 13, EB 62 is explained below;

Validation of CDM awareness (Para 6a):

The validation team has verified the awareness of CDM by Techno Economic Viability Report (TEVR) (Ref /15/) for Manufacture and distribution of CFLs and pre-feasibility report (Ref /14/) for manufacture and distribution of IL prepared and submitted by M/s. B. Nagabhushan & Co. on dtd. 08/02/2008, which is prior to the date of decision i.e. 20/03/2008. The Techno Economic Viability Report (TEVR) (Ref /15/) report considers CDM revenue in the financial assessment attached to the report. Hence, it is evident that the project participant was aware of CDM while making the decision for the PoA/project.

The validation team has also referred to the Minutes of the Board Meeting held on 20/03/2008 which specifies the approval of the CDM-PoA project taking CDM consideration into account. Further, the validation team also interviewed Mr. A. Pratap Reddy (MD, Balaji Greentech Products Ltd.) and Mr. G. Hemanth Reddy (Director, Balaji Greentech Products Ltd.) during the validation site visit to validate the extract of the board resolution and the CDM awareness of the project participant. Hence, based on the supporting documents submitted by the project participant (TEVR dated 08/2/2008 and extract of the board resolution dated 20/03/2008) and office discussion with Mr. A. Pratap Reddy and Mr. G. Hemanth Reddy, the validation team confirms that the project participant was aware of the CDM and CDM benefits were considered necessary at the time of board decision which is in accordance with Para 6 (a) of the Annex 13, EB 62 (Ref /B8/).

Validation of real and continuing actions (Para 6b):

The validation team has validated the time lines of real actions the proposed CDM project activity as tabulated below.



Date	Event	Evidence verified by the validation team
21/11/2007	The PP appointed a consultant for the pre-feasibility report for manufacture and distribution of IL and Techno-Economic Viability for the proposed CDM programme of activity i.e. manufacture and distribution of CFLs on 21/11/2007	Validation team reviewed the Letter of Appointment of M/s. B. Nagabhushan & Co. for the Prefeasibility study of Manufacture and Distribution of ILs in India and for the study of Techno-Economic Viability for Manufacture and Distribution of CFLs dated 21/11/2007 (Ref /21/). The appointment letter clearly describes the scope of study for both the scenarios including their financial viabilities. The appointment letter also mentions the potential benefits of CDM to be considered while working on the project proposal for TEVR for the CFLs.
08/02/2008	M/s. B. Nagabhushan and Company submitted the Pre-feasibility report for IL project and Techno-Economic Viability Report for the proposed CDM Programme of Activity project to the participant.	The validation team has reviewed the following reports submitted by M/s. B. Nagabhushan and Company: 1. Prefeasibility report for Manufacturing of ILs 2. Techno-Economic Viability Report for the said Programme of Activities i.e. Manufacture and Distribution of CFLs The above mentioned reports provide the feasibility and viability of the projects, which also includes the CDM revenue in case of proposed CDM-PoA.
09/02/2008	Application made by PP to the State Bank of Hyderabad for the proposed CDM –PoA	The validation team has reviewed the copy of loan application dated 09/02/2008 submitted to State Bank of Hyderabad (Ref /23/), which was acknowledged by the State Bank of Hyderabad.
20/03/2008	Meeting of the Board of Directors of BGPL	The validation team has reviewed the extract of minutes



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	to finalize the proposed CDM PoA based on the pre-feasibility report and TEVR submitted by M/s. B. Nagabhushan and Co. and consideration of CDM to proceed with the project activity. The Board of Directors agreed to give authority to one of the director to work for CDM activities (Ref /22/).	of meeting of the board of directors held on 20/03/2008 at their registered office and confirmed that the project activity was decided to undertake based on the findings of the TEVRs submitted by the consultant; considering the CDM revenue. The CDM revenue is also one of the considerations in TEVR. (Ref /22/). Mr. G. Hemanth Reddy was authorized to undertake the CDM PoA related activities. The validation team also referred to the register of the minutes of board meetings and reviewed the original copy of the minutes of meeting dated 20/03/2008. The validation team noted that the details provided in the extract of the board meeting are precisely matching with the original meeting decision of the board. Hence, considers the extract as correct and authentic.
16/04/2008	The State Bank of Hyderabad sanctioned the loan based on the loan application made by the PP for the proposed CDM PoA.	The validation team reviewed the Loan sanction letter issued by the State Bank of Hyderabad, a nationalized bank, vide reference no. F/ADV/Balaji Greentech/8 dated 16/04/2008, (Ref /24/) and confirms the date of sanction of the loan. It was noted that the loan sanction letter also refers to the loan application mentioned above. The validation team could ascertain correctness of the date of sanction of loan as stated in the POA-DD.
16/04/2008 (Start Date)	Purchase order issued to M/s. Precision Engineering Works for	The validation team reviewed the Purchase Orders raised on M/s. Precision Engineering



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	the plant and machineries (Ref /13/) for manufacturing of CFLs	Works, vide its letter: Ref. no. BGL/002/8-09 dated 16/04/2008 (Ref /13/) and confirmed the date of purchase order. The validation team also cross checked the date of purchase order based on the Delivery Challans (Ref /38/) and invoices (Ref /39/) issued by M/s. Precision Engineering Works, which also mention the reference no. of the PO and date of PO as indicated above. Hence, the validation team accepted. It is to be noted that this is a first real action taken towards the implementation of the project activity and hence it can be treated as start date of the project activity as per the CDM glossary of terms.
02/05/2008	Clarification from the State Bank of Hyderabad stating that while sanctioning the loan it has considered CDM revenue for the proposed CDM PoA	The validation team is provided with a copy of the letter from State Bank of Hyderabad (vide its letter no. F/OSB/Balaji Greentech/674 dated 02/05/2008), clarifying that CDM revenue has been considered while sanctioning the term loan for the proposed CDM program of activity. The State Bank of Hyderabad is a nationalized bank and can definitely be regarded as credible and authentic source of information. Hence, the validation team has accepted the same.
21/10/2008	The PP appointed a consultant for the CDM-Program of Activities.	The validation team reviewed a copy of Appointment letter of CDM consultant dated 21/10/2008. (Ref /26/). The validation team hereby confirms that this is a first real action taken by the project participant to secure the CDM status which is after 6 months from the start



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		date of the project activity and is within 2 years as per the requirement of the guideline for the demonstration of prior consideration of CDM.
21/10/2008	The PP sent an intimation to UNFCCC and DNA (India) intimating serious consideration of CDM	The validation team has reviewed e-mail communications from the PP to UNFCCC and to DNA, India (Ref /27/) at the PP's terminal during site visit and confirms the date of this intimation.
11/02/2009	An information notice to stakeholder for the review of the PoA was sent to identified	Stakeholder consultation intimation notice (Ref /28/)
07/03/2009	Stakeholder meeting was done on 07/03/2009 (Ref /29/).	Stakeholder consultation meeting on 07/03/2009- MOM thereof (Ref /29/).
22/06/2009	Board meeting held to decided that there will be free distribution of CFLs instead of taking INR 15 from the consumer per CFL. In the above referred Board meeting held by PP wherein it was decided to charge from the customers INR 30 for Single tube CFL and INR 50 for Double tube CFL, to meet the working capital requirement for the operation of the manufacturing plant. (Ref /11/).	Board note dtd. 22/06/2009 where board decision is taken as "Free Distribution of CFLs instead of INR 15" (Ref /10/). In the Board note referred above, where board decided to sale CFLs at a cost of INR 30 for Single Tube CFL and INR 50 for Double Tube type CFL to meet the working capital requirement for the operation of the manufacturing plant (Ref /11/).
12/01/2010	Appointment of DOE	An appointment letter of DOE (BVCH) dtd. 12/01/2010(Ref /30/).
10/04/2010 to 09/05/2010	Web hosting of PoA-DD, CPA-DD, Specific CPA-DD	UNFCCC website



The validation team verified all the evidences related to the project implementation and CDM implementation steps and observed that the project participant had initiated real action in parallel to the implementation of the project activity and that there is less than 2 years of a gap between the documented evidence. All the evidences related to the detailed chronology of events as described in the revised PoA-DD were verified and found to be correct.

From the above discussions, it is observed that the benefits of CDM were a decisive factor in the decision to proceed with the project activity. Further, continuing and real actions were taken by project participant to secure CDM status in parallel with the implementation of the project activity. This is in line with para 8 of Annex 13 of EB 62 (Ref /B8/).

The validation team therefore agrees to the demonstration of the project participant that the CDM was seriously considered in the decision to proceed with the implementation of the project activity.

CL-11 was raised as supporting evidence for start date of PoA was not provided to the validation team. PP, in response, provided the Purchase order, which is a real action towards CDM programme of activity. Having reviewed the purchase orders, the validation team closed the CL.

3.7.1.1 Historical information on project timeline

There is no historical information on the project activity timeline on CDM validation since all the activities have begun after the start date of the CDM project activity.

The validation team during the interaction with the Project Participant representatives noted that the PP has appointed a consultant for the Techno-Economic Viability for the said project on 21/11/2007 (Ref /21/). The consultant also conducted a prefeasibility report for another option to the proposed project activity i.e. manufacture and distribution of ILs. Based on the assessment of these two reports (Ref /14/ and Ref /15/), the PP decided to proceed for the programme of activity implementation considering CDM as decisive factor.

3.7.2 Identification of alternatives (107)

The approved methodology AMS II C version 13 prescribes the baseline scenario in its paragraph 6 with respect to the type of project activity. As prescribed in paragraph 6 of AMS II C, version 13, "If the energy is displaced is electricity, the emission baseline is determined using one of the two following options:



Option 1: The product of the baseline energy consumption of equipment/appliances and the emission factor for the electricity displaced.

Option 2: The specific energy consumption of the system in the baseline times the output in project year y times the emission factor for the electricity displaced. This option can only be used where comparable conditions for the output in the baseline and project can be established.

The proposed project activity involves manufacture and distribution of CFLs in India to replace the ILs where ILs are existing or will be installed in future. The operation of the CFLs instead of ILs will lead to reduction in consumption of electricity which is sourced from the fossil fuel dominant national grid i.e. either NEWNE or Southern grid of India. Thus, options 1 of the above two options is appropriately applicable to the proposed project activity. Since, the applied baseline and monitoring methodology prescribes the baselines scenario, the validation team confirms that no further identification of alternatives is required as per paragraph 107 of VVM manual version 1.2.

3.7.3 Investment analysis (114)

The proposed CDM PoA is a small scale Programme of Activities. Accordingly, the emission reduction in each individual CPA would be less than 60 GWh as per applicability condition as described in the PoA-DD. The project participant has demonstrated the additionality of the project at the PoA level, using the investment barrier, as stated in Attachment A to Appendix B of Simplified modalities and procedures for small scale CDM project activities. It may be further noted that the programmatic CDM project activity demonstrating the additionality of the project at POA level need not demonstrate the additionality at CPA level at the time of addition of CPA. This is in accordance with Para 4, Annex 26 of EB-60. However, at the time of addition of CPA, the CPA will comply with the eligibility criteria described under section A.4.2.2 of POA-DD, which has already been validated above in section 3.6.4 of this report.

Justification by the validation team for acceptance of the investment comparison analysis:

The project activity involves Manufacture and distribution of CFLs in India. As reported in section 3.6.3 above, the identified baseline of the PoA is Manufacture and distribution (sales) of ILs. The Project Participant has chosen "Investment Comparison Analysis" to demonstrate additionality of the programme of activity (PoA). The financial indicator chosen is Post tax Project Internal Rate of Return (IRR), which is found to be appropriate in decision making context as explained above in section 3.7.1. From the above description, it is ascertained that the PP has two



options having similar financial assessment models and hence calculating and comparing Post tax Project IRR is the most appropriate than any other financial indicator as it will take revenue stream, variable cost of manufacturing, fixed cost of manufacturing, cost of production, taxation, excise / sales tax and any other statutory levies, etc in to consideration, which result in at par comparison of the financial results of the baseline and project scenario. The comparison of the financial indicator Post tax Project IRR is done between “Manufacture and Distribution of CFLs” i.e. program activity and “Manufacture and Distribution of ILs” which is a baseline scenario. While accepting the approach of investment comparison analysis, validation team referred EB 62, Annex 5, “Guidelines for the assessment of investment analysis”, Version 5 (Ref /B12/).

The PP has demonstrated that, since alternative option to the project activity is feasible, hence there exists one more option to the CDM PoA project activity and hence, investment can be done in either of the alternative. Although the PP in the web hosted PoA-DD stated that there is no revenue involved in the CDM PoA project activity, subsequently during course of validation activity, the PP decided to sale CFLs at the cost of INR 30 and INR 50 in the retail market and sale of its tube/parts at the rate of INR 4.50 and INR 10, to meet with the operating expenses. The validation team reviewed this from Board note dtd. 22/07/2009 (Ref /11/), where board decided to sell CFLs at a cost of INR 30 for Single Tube CFL and INR 50 for Double Tube type CFL respectively. Another Board note dtd. 24/07/2009 (Ref /12/), provides information on the decision to sell parts of CFLs at a cost of INR 4.50 for Single Tube CFL and INR 10 for Double Tube type CFL. However, the additionality has been cross verified with maximum possible revenue with sell of single tube and double tube CFLs. Hence, looking at this dynamic scenario, the validation team asked PP to conduct an investment analysis on maximum possible revenue because of these decisions. The PP accordingly has calculated IRR for maximum possible revenue i.e. at INR 30 per single tube CFL in the financial spreadsheet (Ref /20a/). The validation team after reviewing various permutation and combination found that maximum possible revenue was by selling 100% of single tube CFLs at a cost of INR 30. On reviewing this, validation team finds that even if PP sales 100% of single tube CFLs in the open market at INR 30, the project is additional, which is validated in the following paragraphs.

Based on the above assessment validation team is of the opinion that approach of investment comparison analysis is most appropriate and well justified.

Validation of Input parameters (114 a)



The input parameters for the financial analysis for the alternative and project activity are validated by the validation team as follows:

Baseline scenario: IL Manufacturing

Parameter	Value of the parameter	Source of input values	Validation justification
Cost of Land	INR 200 Lacs	Prefeasibility report for ILs	<p>The validation team has reviewed the Pre-feasibility report dated 08/02/2008 submitted by the M/s. B. Nagabhushan & Co. This report was available at the time of decision making (20/03/2008). The report on its page no. 22 mentions the same value of land as it was considered at the time of decision making. The total requirement and cost of the land has also been certified separately by M/s. G. Ashokkumar & Associates, who is an independent technical consultant associated with B. Nagabhushan & Co., during the study and preparation of feasibility.</p> <p>The validation team also reviewed the chartered Accountant's certificate of the asset capitalization for the project scenario. The certificate reveals that the actual cost of land incurred is INR 198.41 Lacs. As the requirement of land is similar in both projects and baseline scenario, the validation team considers the cost</p>



			of land as INR 200 Lacs to be appropriate and well justified.
Cost of Plant & Machinery to manufacture ILs including utility equipments	INR 355 Lacs	Page 10 of Prefeasibility report for ILs	<p>The validation team has reviewed the Pre-feasibility report dated 08/02/2008, submitted by M/s. B. Nagabhushan & Co., which was available at the time of decision making (i.e. on 20/03/2008). The report describes that there is a Provisions of Rs. 355 Lacs made for various items of plant & machinery. This includes provision made for erection and installation of the equipment. The equipment to be acquired includes main equipment and testing equipment. The detailed list of which is given as Annexure 1, page 33 of this report while calculating 'depreciation' for the baseline. Since this report was available to the PP at the time of decision making (i.e. 20/03/2008), the value considered in appropriate with respect to the decision timing.</p> <p>Also as reported by M/s. B. Nagabhushan, during personal interview, the value had been iterated from the quotations received from M/s. Precision Engineering works (Ref /32/) and from the inputs provided</p>



			by M/s. G. Ashok Kumar & Associates who is a Chartered Engineer, having more than 25 years of experience in the same field. The validation team having reviewed the Pre-feasibility report, quotations of Precision Engineering Works and personal discussions with Mr. B. Nagabhushan confirms that the value of plant and machinery is well justified and appropriate.
Cost of Building	of INR 220 Lacs	Page 22 of Prefeasibility report for ILs	<p>The validation team has reviewed the Pre-feasibility report dated 08/02/2008, submitted by M/s. B. Nagabhushan & Co., which was available at the time of decision making (i.e. on 20/03/2008). The report describes that there is a Provisions of Rs. 220 Lacs made for civil works and building. This includes provision made for a main factory shed of 3500 sq. Mts., raw material go-down (storage), administrative block, DG room, utilities block and security block. Adequate provision for material storage yard, scrap yard, internal roads, compound wall, bore well, sanitation and electrification.</p> <p>Over and above, the cost of building has been</p>



			<p>estimated with respect to the type of civil work to be executed in detail. This has been carried out by M/s. G. Ashok Kumar & Associates who is a Chartered Engineer, having more than 25 years of experience in the same field.</p> <p>Based on the above assessment and site visit observations, the validation team finds the assumptions are correct and the implementation is also in line with assumption. Hence, with the cross verification of actual implementation of the factory building, the validation is of the opinion that the cost of building considered is correct and appropriate.</p>
Provision for contingencies	INR 25.00 Lacs	Page 10 of Prefeasibility report for ILs	<p>The provision for contingency has been sourced from the Pre-feasibility report available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p> <p>The Pre-feasibility report has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co., who are also empanelled with various nationalized banks for</p>



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			due diligence of the project proposals. Hence, the validation team has accepted the contingency provision based on the Pre-feasibility report available at the time decision making.
Deposits	15.00	Page 10 of Prefeasibility report for ILs	<p>The value of the deposits required with banks has been sourced from the Pre-feasibility report available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p> <p>The Pre-feasibility report has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co., who are also empanelled with various nationalized banks for due diligence of the project proposals. Hence, the validation team has accepted the value of deposits based on the Pre-feasibility report available at the time decision making.</p>
Pre operative expenses	INR 10.00 Lacs	Page 10 of Prefeasibility report for ILs	The value of the pre operative expenses has been sourced from the Pre-feasibility report available at the time of decision making. This has been confirmed by the financial expert of the validation team and



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			<p>is a normative industry practice also.</p> <p>The Pre-feasibility report has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co., who are also empanelled with various nationalized banks for due diligence of the project proposals. The requirement of pre operative expenses has also been evaluated by an industry expert M/s. G. Ashok Kumar & Associates who is a Chartered Engineer, having more than 25 years of experience in the same field.</p> <p>Hence, the validation team has accepted the value of pre operative expenses based on the Pre-feasibility report available at the time decision making.</p>
Margin for working capital	INR 30.00 Lacs	Page 10 of Prefeasibility report for ILs	<p>The value of the working capital margin has been sourced from the Pre-feasibility report available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p> <p>The Pre-feasibility report has been prepared by the professional</p>



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			<p>chartered accountant, M/s. B. Nagabhushan & Co., who are also empanelled with various nationalized banks for due diligence of the project proposals.</p> <p>Hence, the validation team has accepted the value of pre operative expenses based on the Pre-feasibility report available at the time decision making.</p>
Equity to debt ratio	1:2		<p>The value of the equity to debt ratio has been sourced from the Pre-feasibility report available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p>
Debt	570.00	Page 10 of Prefeasibility report for ILs	<p>The value of the debt has been calculated based on the total project cost and DE ratio. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p>
Equity	285.00	Page 10 of Prefeasibility report for ILs	<p>The value of the equity has been calculated based on the total project cost and DE ratio. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p>



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Manufacturing capacity for IL	2000 Bulbs/hr	Page 22 of Prefeasibility report for ILs	<p>The manufacturing capacity of the IL has been considered based on the Pre-feasibility report available at the time of decision making.</p> <p>The validation team has cross checked the capacity from the techno-commercial proposal submitted by M/s. Precision Engineering Works dtd. 21/11/2007 for the manufacturing of Incandescent lamps (Ref /32/).</p> <p>The capacity of IL manufacturing is found correct and appropriate as compared to the project scenario option and with respect to the decision making timing.</p>
Total manufacturing capacity	12,000,000	Prefeasibility report for ILs	Calculated considering 300 days of operation per year and 20 hours of operation per day. The value is correctly calculated and hence acceptable.
Cost of Raw material	INR 4.00 per IL	Page 22 of Prefeasibility report for ILs	<p>The cost of raw material per IL has been sourced from the Pre-feasibility report available at the time of decision making.</p> <p>The pre feasibility report is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a</p>



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			<p>chartered engineer in the same field.</p> <p>Hence, the validation team has accepted the value of cost of raw material per IL based on the pre feasibility report.</p>
Cost of consumables and packing material	INR 0.5 per IL	Page 22 of Prefeasibility report for ILs	<p>The cost of consumables and packing material per IL has been sourced from the Pre-feasibility report available at the time of decision making.</p> <p>The pre feasibility report is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field.</p> <p>Hence, the validation team has accepted the value of cost of consumables and packing material per IL based on the pre feasibility report.</p>
Salaries & Wages	INR 0.75 per IL	Page 22 of Prefeasibility report for ILs	<p>The value of salaries and wages per IL has been sourced from the Pre-feasibility report available at the time of decision making.</p> <p>The pre feasibility report is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G</p>



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			<p>Ashok Kumar & Associates, who is a chartered engineer in the same field. The salaries and wages have been calculated based on the total manpower requirements as listed in Annexure-6 of the pre feasibility report.</p> <p>Hence, the validation team has accepted the value of salaries and wages per IL based on the pre feasibility report.</p>
Escalation in salary and wages	5%	Page 22 of Prefeasibility report for ILs	<p>The value of escalation on salaries and wages has been sourced from the Pre-feasibility report available at the time of decision making.</p> <p>The pre feasibility report is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field. The escalation on the salaries and wages have been calculated based on the total manpower requirements as listed in Annexure-6 of the pre feasibility report.</p> <p>Hence, the validation team has accepted the value of escalation on the salaries and wages based on the pre</p>



			feasibility report.
Cost of Power & Fuel	INR 1.5 per IL	Page 22 of Prefeasibility report for ILs	<p>The cost of power and fuel per IL has been calculated based on the Annexure 6 of the Prefeasibility report available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field.</p> <p>Hence, the validation team has accepted the value of cost of power and fuel per IL based on the pre feasibility report.</p>
Cost of Repairs and maintenance	INR 10.00 Lacs per Annum	Page 22 of Prefeasibility report for ILs	<p>The cost of repair and maintenance has been calculated based on the Annexure 6 of the Prefeasibility report available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field.</p> <p>Hence, the validation team has accepted the same.</p>
Escalation on repair and	20%	Page 22 of Prefeasibility report for ILs	The escalation on the cost of repair and maintenance has been



maintenance			calculated based on the Annexure 6 of the Pre-feasibility report available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field. The value of escalation on the Repair and Maintenance cost is found to be same as the value considered in the project scenario i.e. in the TEVR, which has been approved by the nationalized bank. Hence, the validation team accepted this value for at par comparison of baseline and project scenario.
Other Manufacturing expense	INR 0.75 per IL	Page 22 of Prefeasibility report for ILs	The cost of the manufacturing expenses, other than mentioned above, has been calculated based on the projection of performance and profitability under the Pre-feasibility report available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the



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			<p>same field.</p> <p>Hence, the validation team has accepted the same.</p>
Selling price of ILs	INR 15 per IL	Page 4, Bachat Lamp Yojana	<p>The project participant had referred to the details of Bachat Lamp Yojana, which is a programme of Government of India. The documents of Bachat Lamp Yojana clearly indicate the price of IL as INR 15. Further, the project participant took a decision in its board meeting dated 20/03/2008, where in the consideration of cost of IL as INR 15 has been reiterated. Hence, the validation team accepts the cost of IL as INR 15.</p>
Administrative charges	INR 0.7 Lacs per month + 10% increment	Page 22 of Prefeasibility report for ILs	<p>The value of administrative charges has been sourced from the Pre feasibility report available with PP at the time of decision making.</p> <p>The validation team considers the pre feasibility report as an appropriate source for input values. The validation team has reviewed the copy of the pre feasibility report prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of</p>



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			the project proposals and hence, can be regarded as authentic and reliable source of this information.
Selling & Distribution expenses	INR 0.25 per IL	Page 22 of Prefeasibility report for ILs	<p>The value of selling and distribution expenses has been sourced from the Pre feasibility report available with PP at the time of decision making.</p> <p>The validation team considers the pre feasibility report as an appropriate source for input values. The validation team has reviewed the copy of the pre feasibility report prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals and hence, can be regarded as authentic and reliable source of this information.</p>
Total LC requirement	INR 180 Lacs per annum	Annexure 4, page 36 of Prefeasibility report for ILs	The values of the parameters of LC (Letter of Credit) have been sourced from the Pre feasibility report available with PP at the time of decision making.
LC utilization considered in first year	INR 72 Lacs	Annexure 4, page 36 of Prefeasibility report for ILs	
LC utilization considered from second year	INR 108 Lacs	Annexure 4, page 36 of Prefeasibility report for ILs	The validation team considers the pre feasibility report as an appropriate source for input values. The validation team has
Margin for working	25%	Annexure 4, page 36 of Prefeasibility	



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capital		report for ILs	reviewed the copy of the pre feasibility report prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals and hence, can be regarded as authentic and reliable source of this information.
Interest on term loan	13%	13% interest rate, the loan will be paid in 6 years; Page 22 of Prefeasibility report for ILs	The interest rates of the term loan and working capital loan are considered based on the Pre feasibility report available with PP at the time of decision making.
Interest on working capital	13%	13% interest rate; Page 22 of Prefeasibility report for ILs	The validation team considers the pre feasibility report as an appropriate source for input values. The validation team has reviewed the copy of the pre feasibility report prepared by third party M/s. B. Nagabhushan & Co., which is professional Chartered Accountant company empanelled with nationalized banks for the due diligence of the project proposals and hence, can be regarded as authentic and reliable source of this information.
Depreciation as per Income tax act, 1961			
Civil works	10%	Rule 5, Appendix I of Income Tax Act	The rate of depreciation has been sourced from

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Plant & Machinery	15%	1961 Rule 5, Appendix I of Income Tax Act 1961	the Income Tax Act, 1961 of India, i.e. Host Country. Hence, the rate of depreciation is accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
Depreciation as per Companies act, 1956			
Civil works	3.34%	Schedule XIV of The Companies Act 1956	The rate of depreciation has been sourced from the Companies Act, 1956 of India, i.e. Host Country. Hence, the rate of depreciation is accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
Plant & Machinery	5.28%	Schedule XIV of The Companies Act 1956	The rate of depreciation has been sourced from the Companies Act, 1956 of India, i.e. Host Country. Hence, the rate of depreciation is accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
Tax rate	33.99%	Page 3, http://www.incometaxindia.gov.in/Archive/Filing Your Tax Return.pdf	The rate of corporate tax has been sourced from the Indian Income Tax Act. The rate of income tax is stated as 30% plus Surcharge of 10%, education cess of 2% and additional cess of 1% will be levied. Thus, the total applicable income tax rate would be Basic rate: 30% + Surcharge: 3% @ 10% + Edu.Cess:0.66% @ 2% + Add.Cess:0.33% @ 1% Total : 33.99% This has bee accepted

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			as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
MAT	11.33%	Page 4 of http://indiabudget.nic.in/ub2007-08/frbm/frbm3.pdf	<p>The rate of MAT has been sourced from the Indian Budget document for the fiscal policies. The rate of MAT is stated as 10% plus Surcharge of 10%, education cess of 2% and additional cess of 1% will be levied. Thus, the total applicable income tax rate would be</p> <p>Basic rate: 10% + Surcharge: 1% @ 10% + Edu.Cess:0.22% @ 2% + Add.Cess:0.11% @ 1%</p> <p>----- Total : 11.33%</p> <p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.</p>
Excise duty	8.00%	Page 13 of Prefeasibility report for ILs	<p>The excise rate has been sourced from the Government of India.</p> <p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of</p>

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VAT	12.50%	Page 11, https://www.apcommercialsaxes.gov.in/allacts/vat/whitepaper_VAT.doc	<p>investment analysis.</p> <p>The VAT has been sourced from the Government of Andhra Pradesh web site for the commercial taxes, which is the state the manufacturing plant of the PP is located.</p> <p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.</p>
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Assumptions for project scenario (Manufacturing and Distribution of CFLs in India)

Parameter	Value of the parameter	Source of input values	Validation justification
Cost of Land	INR 200 Lacs	Chapter 12, Page 22 of TEVR;	The validation team has reviewed the Techno-Economic Viability Report dated 08/02/2008 submitted by the third party M/s. B. Nagabhushan & Co., who are also professional Chartered Accountants empanelled with national banks for the due diligence of the project proposals. This report was available at the time of decision making (20/03/2008). The report on its page no. 22 mentions the same value of land as it was considered in the investment analysis. The



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			<p>total requirement and cost of the land has also been certified separately by M/s. G. Ashokkumar & Associates, who is an independent technical consultant and chartered engineer associated with B. Nagabhushan & Co., during the study and preparation of TEVR for the Manufacture and distribution of CFLs.</p> <p>The validation team also reviewed the certificate issued by their Chartered Accountant (Ref /43/), which certifies that the actual cost of land capitalized is INR 198.41 Lacs. Thus, having reviewed the actual cost of land and TEVR, the validation team is of the opinion that cost of land considered in the investment analysis is appropriate as it is from the authentic third party source available at the time of decision making.</p>
Cost of Civil works for CFL manufacturing facility	INR 339.40 Lacs	Chapter 12, Page 22 of TEVR;	<p>The validation team has reviewed the TEVR report dated 08/02/2008, submitted by M/s. B. Nagabhushan & Co., which was available at the time of decision making i.e. 20/03/2008.</p> <p>The report in Annex 1 describes that there is a Provision of INR 339.40 Lacs made for civil works and building. This</p>



			<p>includes provision made for a main factory shed of 6500 sq. Mts., raw material go-down (storage) of 520 Square meter, administrative block of 60 Sq. meter, DG room of 60 Sq. meter, utilities block and security block. Adequate provision for material storage yard of 1320 sq. meters, scrap yard, internal roads, compound wall of 570 Running meter, bore well, sanitation and electrification.</p> <p>Over and above, the cost of building has been estimated with respect to the type of civil work to be executed in detail. This has been carried out by M/s. G. Ashok Kumar & Associates who is a Chartered Engineer, having more than 25 years of experience in the same field.</p> <p>Based on the above assessment and site visit observations, the validation team finds the assumptions are correct and the implementation is also in line with assumption. Hence, with the cross verification of actual implementation of the factory building, the validation is of the opinion that the cost of building considered is</p>
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			correct, appropriate and well justified.
Cost of Plant & Machinery to manufacture CFLs including utility equipments	INR 1650.45 Lacs	Chapter 12, Page 22 of TEVR;	<p>The validation team has reviewed the TEVR report dated 08/02/2008, submitted by third party M/s. B. Nagabhushan & Co., which was available at the time of decision making i.e. 20/03/2008.</p> <p>The report describes that there are provisions of INR 1650.45 Lacs made for various items of plant & machinery. This includes provision made for erection and installation of the equipments. The equipment to be acquired includes main manufacturing equipments and testing equipments. The detailed list of which is given as Annexure IIA, and Annexure IIB of this report while calculating the total machinery cost for the project. Since this report was available to the PP at the time of decision (20/03/2008), the same is considered to be appropriate to the decision making timing.</p> <p>Also as reported by M/s. B. Nagabhushan, during personal interview, the value had been iterated from the quotations received from M/s. Precision Engineering Works (Ref /31/) and</p>



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			<p>from the inputs provided by M/s. G. Ashok Kumar & Associates, Chartered Engineer, having more than 25 years in the field.</p> <p>The validation team having reviewed the TEVR, quotations from the technology supplier available while preparing the TEVR and personal interview of the third party confirms that the value considered is appropriate and well justified for the project activity.</p>
Cost of Misc fixed assets	INR 15.00 Lacs	Chapter 12, Page 22 of TEVR	<p>The validation team has reviewed the TEVR report dated 08/02/2008, submitted by third party M/s. B. Nagabhushan & Co., which was available at the time of decision making i.e. 20/03/2008.</p> <p>The report includes that there is a provision of INR 15 Lacs made for various items of office infrastructure under miscellaneous fixed assets. This is observed to be appropriate for a new factory setup and hence accepted by the validation team.</p>
Provision for contingencies	INR 29.09 Lacs	Chapter 12, Page 22 of TEVR	<p>The provision for contingency has been sourced from the TEVR available at the time of decision making. This has been confirmed by the financial expert of</p>



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			<p>the validation team and is a normative industry practice also.</p> <p>The TEVR been prepared by a professional chartered accountant company, M/s. B. Nagabhushan & Co. (third party), who are also empanelled with various nationalized banks for due diligence of the project proposals. Further, the same TEVR has been approved by the State Bank of Hyderabad for sanctioning the term loan.</p> <p>Hence, the validation team has accepted the contingency provision based on the TEVR available at the time decision making.</p>
Deposits	INR 30.00 Lacs	Chapter 12, Page 22 of TEVR	<p>The value of the deposits required with banks has been sourced from the TEVR available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also with respect to the project cost.</p> <p>The TEVR has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co. (third party), who are</p>



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			<p>also empanelled with various nationalized banks for due diligence of the project proposals. Further, the TEVR has also been approved by the State Bank of Hyderabad for sanctioning the term loan.</p> <p>Hence, the validation team has accepted the value of deposits based on the TEVR available at the time decision making.</p>
Pre operative expenses	INR 58.15 Lacs	Chapter 12, Page 22 of TEVR;	<p>The value of the pre operative expenses has been sourced from the TEVR available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also with respect to the cost of project.</p> <p>The TEVR has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co. (third party), who are also empanelled with various nationalized banks for due diligence of the project proposals.</p> <p>The requirement of pre operative expenses has also been evaluated by an industry expert M/s. G. Ashok Kumar &</p>



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			<p>Associates who is a Chartered Engineer, having more than 25 years of experience in the same field.</p> <p>Further, the TEVR has also been approved by the State Bank of Hyderabad for sanctioning the term loan and hence can be considered authentic and reliable.</p> <p>Hence, the validation team has accepted the value of pre operative expenses based on the Pre-feasibility report available at the time decision making.</p>
Margin for working capital	INR 89.31 Lacs	Chapter 12, Page 22 of TEVR;	<p>The value of the working capital margin has been sourced from the TEVR available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also with respect to the project cost.</p> <p>The TEVR has been prepared by the professional chartered accountant, M/s. B. Nagabhushan & Co. (third party), who are also empanelled with various nationalized banks for due diligence of the project proposals.</p>



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			<p>The TEVR has also been approved by the State Bank of Hyderabad for sanctioning the term loan and hence can be considered authentic and reliable.</p> <p>Hence, the validation team has accepted the value of pre operative expenses based on the Pre-feasibility report available at the time decision making.</p>
Total project cost	2257.38	Calculated	<p>The total project has been calculated based on the above explained project cost component. In addition to the above cost break up, the proposed project cost also includes the cost of production line-2 making the total project cost of INR 2257.38 Lacs. The same is found to be correct and hence accepted by the validation team.</p>
Equity to debt ratio	1:1.61	Chapter 6, Page 7 of TEVR	<p>The value of the equity to debt ratio has been sourced from the TEVR available at the time of decision making. This has been confirmed by the financial expert of the validation team and is a normative industry practice also.</p>



Equity	857.80	Chapter 6, Page 7 of TEVR	<p>The values of debt and equity are calculated based on the DE ratio as considered in the TEVR, which was available with PP at the time of decision making. Further, the DE ratio can be accepted as the TEVR has been approved by the State Bank of Hyderabad for sanctioning the term loan.</p> <p>The calculated values of equity and debt are found to be correct and appropriate with respect to the total cost of the project.</p>
Debt	1399.58	Chapter 6, Page 7 of TEVR	
Manufacturing capacity for CFL	2400 CFLs/Hr	Annexure 1, Page 32 of TEVR	<p>The manufacturing capacity of the CFL has been considered based on the TEVR available at the time of decision making. As per the TEVR, the capacity of one production line is 1200 CFLs/Hr. The project involves two such production lines making total capacity of 2400 CFLs/Hr.</p> <p>The validation team has cross checked the capacity of each production line based on the techno-commercial proposal submitted by M/s. Precision Engineering Works dtd. 21/11/2007 for the manufacturing of CFLs (Ref /31/). The same</p>



			<p>proposal has also been made available by PP to M/s. B. Nagabhushan & Co. for the purpose of TEVR.</p> <p>The capacity of CFL manufacturing is found correct and appropriate with respect to the decision making timing.</p>
Total manufacturing capacity	14,400,000 CFLs	Annexure 1, Page 32 of TEVR	This has been calculated considering 300 days of operation per year and 20 hours of operation per day. The production capacity considered in calculation is 2400 CFLs/Hr. The project involves two production lines each having capacity of 1200 CFLs/Hr. The value is correctly calculated and hence acceptable.
Cost of Raw material		Chapter 12, Page 22 of TEVR	The cost of raw material per CFL has been sourced from the TEVR available at the time of decision making.
Single tube CFL	INR 7.48 per CFL		<p>The TEVR is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. (third party) in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field. M/s. B. Nagabhushan & Co. is empanelled with various nationalized banks for the due diligence of the project proposals.</p>
Double tube CFL	INR 26.52 per CFL		



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			<p>Hence, the TEVR can be considered reliable and authentic source of information.</p> <p>The above mentioned TEVR is also approved by the State Bank of Hyderabad while sanctioning the term loan and hence can definitely be regarded as a justified source of information.</p> <p>The validation team has reviewed the TEVR and found that Annexure 1A and 1B of the TEVR mention explicit list of the raw material and its consumption for production of one single tube and double tube CFL respectively. This has been prepared in a consultation with an industrial expert Mr. G Ashok Kumar having more than 25 years of experience in the same field.</p> <p>Hence, the validation team has accepted the value of cost of raw material per CFL (single tube) based on the review of TEVR.</p>
Cost of consumables and packing material	4% of Gross Sales	Chapter 12, Page 22 of TEVR	<p>The cost of consumables and packing material has been sourced from the TEVR available at the time of decision making.</p> <p>The TEVR prepared by a</p>



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			<p>professional chartered accountant M/s. B. Nagabhushan & Co. (third party) in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer having more than 25 years of experience in the same field.</p> <p>Further the same TEVR is also accepted and approved by State Bank of Hyderabad and hence can definitely be considered as an authentic and reliable source of information.</p> <p>Having reviewed the TEVR, the validation team has accepted the value of cost of consumables and packing material.</p>
Salaries & Wages		Annexure 2 page 35 of TEVR	The value of salaries and wages has been sourced from the TEVR available at the time of decision making.
Year 1	79.76	For 8 months of operation	
Year 2	125.62	For 2 nd year	The TEVR is prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. (third party) in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer having more than 25 years of experience in the same field. The salaries and wages have
YoY escalation	5%	Chapter 12, Page 22 of TEVR	



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			<p>been calculated based on the total manpower requirements as listed in Annexure-2 of the TEVR.</p> <p>Hence, the validation team has accepted the value of salaries and wages based on the TEVR.</p>
Power & fuel		Annexure 3 page 36 of TEVR	<p>The cost of power and fuel has been calculated based on the Annexure 3 of the TEVR available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer having more than 25 years of experience in the same field.</p> <p>It may be noted that the cost of power and fuel is kept constant from the 4th year onwards, which is a conservative approach. This is due to constant capacity utilisation from 4th year as per TEVR. The capacity utilisation considered for 1st, 2nd and 3rd year is 50%, 60% and 65% respectively. From the 4th year onwards the same has been considered 70%.</p> <p>Further, the same TEVR</p>
Year 1	117.65		
Year 2	209.48		
Year 3	225.98		
Year 4	242.49		



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			<p>has also been accepted by the nationalized bank State Bank of Hyderabad and hence can be considered reliable and authentic source of information.</p> <p>Hence, the validation team has accepted the value of cost of power and fuel based on the TEVR.</p>
Cost of Repairs and Maintenance	<p>INR 50.12 Lacs for first year</p> <p>With escalation of 20% YoY</p>	Chapter 12, Page 22 of TEVR	<p>The cost of repair and maintenance has been calculated considering 2.5% of the fixed asset value as per the TEVR available at the time of decision making, which has been prepared by a professional chartered accountant M/s. B. Nagabhushan & Co. in consultation with M/s. G Ashok Kumar & Associates, who is a chartered engineer in the same field.</p> <p>Also, the TEVR has been approved and accepted by the nationalized bank "State Bank of Hyderabad" and hence considered as an acceptable source of information.</p> <p>Hence, the validation team has accepted the same.</p>
Selling price ⁶		Minutes of Board meeting dated 22	The validation team has reviewed the original

⁶ Applicable in scenario of "Sale to market" instead of PoA for which the validation of IRR is reported later in this section of report. Refer to SCENARIO-2.



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Single tube CFL	INR 30 per CFL	June 2009	Minutes of the Meeting of the Board of Directors dated 22/06/2009, which states that the project participant will sale the CFLs to meet the working capital requirements for the smooth operation and sustenance of manufacturing plant. However, the CFLs sold into the market will not be accounted in the PoA and In claiming the emission reductions. This will be cross verified based on the plant records of CFLs sold outside the PoA.
Double tube CFL	INR 50 per CFL		The validation team also discussed with the Director of the Project Participant. As reported by the Director, the PP invited price list and proposal from the retail market i.e. from HPL, who is a well known CFL manufacturer in India. The price was decided based on the prevailing market rate and proposal of HPL. The validation team has reviewed the proposal of HPL and found that the PP has decided a price lower than HPL for faster penetration in the market. Hence, the validation team has accepted the selling price of CFL.
Administrati	2 Lacs per	Chapter 12, Page	The value of



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on charges	month + 10% increment	22 of TEVR	<p>administrative charges has been sourced from the TEVR available with PP at the time of decision making.</p> <p>The validation team considers the TEVR as an appropriate source for input values. The validation team has reviewed the copy of the TEVR prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals.</p> <p>Further, the TEVR has been approved by the nationalized bank i.e. State Bank of Hyderabad for sanctioning the term loan and hence, can be regarded as authentic and reliable source of this information.</p>
Selling & Distribution expenses	7.50% of Gross Sales	Chapter 12, Page 22 of TEVR	<p>The value of selling and distribution expenses has been sourced from the TEVR available with the PP at the time of decision making.</p> <p>The validation team considers the TEVR as an appropriate source for input values. The validation team has reviewed the copy of the TEVR prepared by third party M/s. B.</p>



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			<p>Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals.</p> <p>Further, the TEVR has been approved by the nationalized bank i.e. State Bank of Hyderabad for sanctioning the term loan and hence, can be regarded as authentic and reliable source of this information.</p>
LC requirement	INR 180	Annexure 7A, page 41 of TEVR	<p>The values of the parameters of LC (Letter of Credit) have been sourced from the TEVR available with PP at the time of decision making.</p>
LC utilization considered in first year	72	Annexure 7, page 40 of TEVR	<p>The validation team considers the TEVR as an appropriate source for input values. The validation team has reviewed the copy of the TEVR prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals.</p>
LC utilization considered from second year	108	Annexure 7, page 40 of TEVR	



Margin for working capital	25%	Annexure 7, page 40 of TEVR	Further, the TEVR has been approved by the nationalized bank i.e. State Bank of Hyderabad for sanctioning the term loan and hence, can be regarded as authentic and reliable source of this information.
Interest on term loan	13%	13% interest rate, the loan will be paid in 7 years; Chapter 12, Page 22 of TEVR	The interest rates of the term loan and working capital loan are considered based on the TEVR available with PP at the time of decision making. The validation team considers the TEVR as an appropriate source for input values. The validation team has reviewed the copy of the TEVR prepared by third party M/s. B. Nagabhushan & Co., who are professional Chartered Accountant empanelled with nationalized banks for the due diligence of the project proposals.
Interest on working capital	13%	Chapter 12, Page 22 of TEVR; Interest rate, computation of working capital as shown in Annexure 7 of technical analysis report	Further, the TEVR has been approved by the nationalized bank i.e. State Bank of Hyderabad for sanctioning the term loan and hence, can be regarded as authentic and reliable source of this information.
Depreciation as per Income Tax Act, 1961			



Building	10%	Rule 5, Appendix I of Income Tax Act 1961	The rate of depreciation has been sourced from the Income Tax Act, 1961 of India, i.e. Host Country. Hence, the rate of depreciation is accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
Plant & Machinery	15%	Rule 5, Appendix I of Income Tax Act 1961	
Other misc assets	15%	Rule 5, Appendix I of Income Tax Act 1961	
Depreciation as per Companies Act, 1956			
Building	3.34%	Schedule XIV of The Companies Act 1956	The rate of depreciation has been sourced from the Companies Act, 1956 of India, i.e. Host Country. Hence, the rate of depreciation is accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.
Plant & Machinery	5.28%	Schedule XIV of The Companies Act 1956	
Other misc assets	5.28%	Schedule XIV of The Companies Act 1956	
Other regulatory taxes and duties applicable in the host country			
Tax rate	33.99%	Page 3, http://www.incometaxindia.gov.in/Archive/Filing_Your_Tax_Return.pdf	<p>The rate of corporate tax has been sourced from the Indian Income Tax Act. The rate of income tax is stated as 30% plus Surcharge of 10%, education cess of 2% and additional cess of 1% will be levied. Thus, the total applicable income tax rate would be</p> <p>Basic rate: 30% + Surcharge: 3% @ 10% + Edu.Cess:0.66% @ 2% + Add.Cess:0.33% @ 1%</p> <hr/> <p>Total : 33.99%</p>

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			<p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.</p>
MAT	11.33%	<p>Page 4 of http://indiabudget.nic.in/ub2007-08/frbm/frbm3.pdf</p>	<p>The rate of MAT has been sourced from the Indian Budget document for the fiscal policies. The rate of MAT is stated as 10% plus Surcharge of 10%, education cess of 2% and additional cess of 1% will be levied. Thus, the total applicable income tax rate would be</p> <p>Basic rate: 10% + Surcharge: 1% @ 10% + Edu.Cess: 0.22% @ 2% + Add.Cess: 0.11% @ 1%</p> <p>----- Total : 11.33%</p> <p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.</p>
Excise duty	8.00%	Annexure 1, Page 32 of TEVR	<p>The excise rate has been sourced from the Government of India and source was available at the time of decision making.</p> <p>This has been accepted as the same is in accordance with the</p>

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			accounting principle of the host country and guidelines for the assessment of investment analysis.
VAT	12.50%	Page 11, https://www.apcomercialtaxes.gov.in/allacts/vat/whitepaper_VAT.doc	<p>The VAT has been sourced from the Government of Andhra Pradesh web site for the commercial taxes, which is the state the manufacturing plant of the PP is located.</p> <p>This has been accepted as the same is in accordance with the accounting principle of the host country and guidelines for the assessment of investment analysis.</p>
CERs			
Grid Emission factor	NEWNE: 0.8031 Southern: 0.8557	CEA Emission factor database, version 4	<p>The grid emission factors are calculated based on the CEA database version 4 and tool to calculate emission factor for an electricity system. The CEA database version 4 was available at the time of decision making and hence accepted by the validation team.</p> <p>Further, the emission factors are also in accordance with the applied baseline and monitoring methodology.</p>
CER price	15	Page 8, http://www.eex.com/en/document/32370/presentation_cer	The rate of CER has been sourced from the publicly available information available at

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		futures%20%27english%28.pdf	the time of decision making and hence accepted by the validation team.
Exchange rate, Euro - INR	60.48	Average value for exchange from 15 Feb 2008 to 15 March 2008 http://www.rbi.org.in/scripts/ReferenceRateArchive.aspx	The exchange rate of EUR to INR has been considered from the Reserve Bank of India, which is a central bank of the host country. Since the source is RBI and available at the time of decision making, the validation team has accepted the same.

From the above description, the validation team confirms that the input values considered by the PP for the financial calculations were available to PP at the time of decision making of the CDM Program of Activities. The input values are either based on the consultant's documents (third party, i.e. M/s. B. Nagabhushan's report), the original quotations from the technology supplier which were available while conducting the TEVR to M/s. B. Nagabhushan, government websites for income tax, depreciation, sales tax and other third party credible sources, hence are appropriate in line with Para 114 (a) of the VVM 1.2

The demonstration of additionality using investment comparison analysis has been assessed for the following three scenarios due to dynamic changes considered by the PP during the course of validation.

Scenario 1 : Free distribution of CFLs for the replacement of IL with a prevailing market price of INR 15 per IL.

Scenario 2 : Sale of Single tube CFLs (15% of production capacity) at a price of INR 30 and Double tube CFLs (85% of production capacity) at a price of INR 50 against IL with a prevailing market price of INR 15 per IL.

Scenario 3 : Sale of Single tube CFLs (100% production capacity of BGPL) at a price of INR 30 against IL with a prevailing market price of INR 15 per IL.

The validation team has validated above mentioned scenarios for the robustness of additionality in following manner.

Scenario 1 : Free distribution of CFLs for the replacement of IL with



a prevailing market price of INR 15 per IL.

The validation team noted that the investment analysis submitted at the start of validation considered the distribution at a price of INR 15 per CFL. This was confirmed by the validation team from TEVR which was submitted by M/s. B. Nagabhushan & Co., a basis of decision of the Board of the Directors of BGPL dated 20/03/2008 (Ref /22/). However, the web hosted PoA-DD iterated the cost of CFL as INR 15 as well as free distribution also. The validation team raised CL 31 on this discrepancy.

In response, the PP clarified that at the time of conceptualization of the CDM-PoA, the PP considered distribution at a price of INR 15 per CFL to make it comparable with cost of IL for sale in to the retail market. This was to achieve penetration of CFLs by replacing ILs. Later on, the project participant decided that for the faster penetration of CFL, it will be distributed free of cost as in any of the scenario mentioned above, the PP will have negative cash inflow. Hence, the Board of Directors of BGPL decided that to improve the penetration of CFLs in the market at a faster pace than earlier envisaged, the CFLs would be distributed "Free of Cost" in the identified regions of PoA. The validation team reviewed the Minutes of Meeting of Board of Directors dated 22/06/2009 (Ref /10/) and confirms the decision taken by BGPL.

Accordingly, the project participant submitted the revised investment analysis including free distribution of CFLs.

Validation of IRR calculation of Scenario-1:

Based on the decision taken by the Board of Directors, of BGPL on 22/06/2009 and validation of input parameters, and values therein, the validation team assessed the IRR calculations (Ref /20a/) along with the financial expert who is a professional chartered accountant and forms a part of the validation team. The IRR of both the scenarios under investment comparison is as tabulated below.

Financial indicator	Baseline scenario ⁷	Project scenario-1 ⁸
Post tax Project IRR	40.84%	No revenue as free distribution of CFLs is considered

From the above table, validation team confirms that the Scenario-1 of the proposed CDM-PoA i.e. "Free Distribution of CFLs" demonstrates that the project activity is "additional" while comparing it to sale of IL at a price of INR 15, which is a baseline or business as usual scenario. This is in

⁷ Manufacture and distribution of ILs at a price of INR 15

⁸ Manufacture and distribution of CFLs free of cost



accordance with the non-binding best practice examples on the demonstration of additionality to assist the development of project design documents, in particular for small-scale project activities (EB 35, Annex 34). Accordingly, the PP has correctly demonstrated the Investment barrier, and validation team confirms that the proposed CDM PoA is additional.

Scenario 2 : Sale of Single tube CFLs (15% of production capacity) at a price of INR 30 and Double tube CFLs (85% of production capacity) at a price of INR 50 against IL with a prevailing market price of INR 15 per IL.

Based on the site visit observations of the validation team and its discussion with the project participant, it was observed that, PP wishes to sale some of the CFLs manufactured from its plant into the market. The validation team raised CL 31 as it was not described in the web hosted PoA-DD. In response, the PP clarified that although PP wishes to route 100% CFLs through PoA, but to meet with the operational expenses and sustenance of the plant, it might sale CFLs at a cost as decided in the board meeting dated 22/06/2009. The validation team reviewed the Minutes of Board Meeting dated 22/06/2009 (Ref /10/) which reiterates that *to meet the operating expenses and to maintain working capital, the company would also sell the CFLS in the retail market price of Rs. 30 for single type and Rs. 50 for double type under the current market condition.* The project participant has now included investment comparison analysis for scenario-2 (as mentioned above) in the revised PoA-DD and the spreadsheets are also submitted separately to the validation team.

Further, it could not be ascertained by the validation team, as to what percentage of total production would be sold into the market for the above said reasons. Hence, for the purpose of robust demonstration of additionality, the project participant calculated the IRR for this scenario considering that 100% of the total production would be sold to market, which is the most conservative scenario. Of the total, 15% would be single tube type CFL and 85% would be double type CFLs. The proportion of single tube and double tube CFLs was considered based on the TEVR (Ref /15/) submitted by M/s. B. Nagabhushan & Co., which was prior to the first decision of PP on 20/03/2008. Having reviewed the revised PoA-DD and spread sheets (Ref /20a/, /20b/ & /20c/) validation team closed the CL 31.

Validation of IRR calculation of Scenario -2:

Based on the decision taken by the Board of Directors, of BGPL on 22/06/2009 and validation of input parameters, and values therein, the validation team assessed the IRR calculations (Ref /20b/) along with the financial expert who is a professional chartered accountant and forms a



part of the validation team. The IRR of both the scenarios under investment comparison is as tabulated below:

Financial indicator	Baseline scenario ⁹	Project scenario-2 ¹⁰
Post tax Project IRR	40.84%	23.97%

From the above table, validation team confirms that the Scenario-2 of the proposed CDM-PoA i.e. Manufacture and distribution of CFLs at a selling price of Single tube at INR 30 and Double tube at INR 50 per CFL considering 100% sale into market, conservatively demonstrates that the project activity is "additional" while comparing it to sale of IL at a price of INR 15, which is a baseline or business as usual scenario. This is in accordance with the non-binding best practice examples on the demonstration of additionality to assist the development of project design documents, in particular for small-scale project activities (EB 35, Annex 34). Accordingly, the PP has correctly demonstrated the Investment barrier, and validation team confirms that the proposed CDM PoA is additional.

Scenario 3 : Sale of Single tube CFLs (100% production capacity of BGPL) at a price of INR 30 against IL with a prevailing market price of INR 15 per IL.

As explained above in scenario-2, the PP may sale 100% of the produced CFLs in a market without PoA route. For which a scenario considering sale of 15% single tube and 85% double tube (of the total production of CFLs) into the market has been demonstrated in scenario-2. The proportion of single tube to double tube was based on the TEVR (Ref /15/).

However, from the scenario-2, it could not be ascertained that the PP gets maximum IRR from the sales of CFLs. Hence, the PP performed various checks in the IRR calculations and established that the maximum IRR can be availed by producing and selling 100% of single tube CFLs at a price of INR 30 per CFL.

The project participant presented the IRR calculations (Ref /20c/). The validation team reviewed and checked the spreadsheets and found that the most conservative scenario is sale of single tube CFL at a price of INR 30 per CFL giving maximum IRR as compared to any other scenario. The validation team hence confirms that the scenario-3 is the most

⁹ Manufacture and distribution of ILs at a price of INR 15

¹⁰ Manufacture and distribution of CFLs –Sale of Single tube at INR 30 and Double tube at INR 50 per CFL considering 100% sale into market, conservatively.



conservative scenario to demonstrate the additionality of the proposed CDM PoA.

Validation of IRR calculation of Scenario -3:

Based on the validation of input parameters, and values therein, the validation team assessed the IRR calculations (Ref /20c/) along with the financial expert who is a professional chartered accountant and forms a part of the validation team. The IRR of both the scenarios under investment comparison is as tabulated below:

Financial indicator	Baseline scenario ¹¹	Project scenario-3 ¹²
Post tax Project IRR	40.84%	27.77%

From the above table, validation team confirms that the Scenario-3 of the proposed CDM-PoA i.e. Manufacture and distribution of CFLs at a selling of Single tube at price of INR 30, conservatively demonstrates that the project activity is “additional” while comparing it to sale of IL at a price of INR 15, which is a baseline or business as usual scenario. The PP has correctly demonstrated the Investment barrier, and validation team confirms that the proposed CDM PoA is additional.

Sensitivity Analysis:

In order to show the robustness of the financial calculations the PP has carried out the sensitive analysis for reasonable variations in the critical assumptions, in line with “Demonstration and assessment of additionality” Version 6, EB 65, Annex 21 (Ref /B7/). The sensitivity analysis is carried out on parameters which may affect the project activity.

As per Para 20 of “Guidelines on the assessment of investment analysis” EB 62, Annex 5, Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude), and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets. Where a DOE considers that a variable which constitute less than 20% has a material impact on the analysis they shall raise a corrective action request to include this variable in the sensitivity analysis.

¹¹ Manufacture and distribution of ILs at a price of INR 15

¹² Manufacture and distribution of CFLs –Production and Sale of 100% Single tube at INR 30 into market, the most conservative scenario.



Accordingly, the Validation team confirmed that the project activity is sensitive to the following parameters which constitute more than 20% of either total project costs or total project revenues of the initial investment cost:

- Production capacity
- CFL Raw material price
- Project cost

As demonstrated in the PoA-DD and calculated in the financial spreadsheet, the results of the sensitivity analysis are as follows:

Scenario1: Free distribution of CFLs for the replacement of IL with a prevailing market price of INR 15 per IL.

	Variation	Project IRR of CFL (Project Activity)	Project IRR of IL (Baseline)
Basic Project IRR value	--	#DIV/0!*	40.84%
Production Capacity	+10%	#DIV/0!*	48.40%
	-10%	#DIV/0!*	33.54%
Raw material price	+10%	#DIV/0!*	38.85%
	-10%	#DIV/0!*	42.79%
Project cost	+10%	#DIV/0!*	37.46%
	-10%	#DIV/0!*	44.87%

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*#DIV/0! shows IRR value is less than zero i.e. negative cash inflow.

Scenario-2: Sale of Single tube CFLs (15% of production capacity) at a price of INR 30 and Double tube CFLs (85% of production capacity) at a price of INR 50 against IL with a prevailing market price of INR 15 per IL.

	Variation	Project IRR of CFL (Project Activity)	Project IRR of IL (Baseline)
Actual		23.97%	40.84%
Production Capacity	+10%	27.58%	48.40%
	-10%	20.17%	33.54%
Raw material price	+10%	18.30%	38.85%
	-10%	29.13%	42.79%
Project cost	+10%	21.79%	37.46%
	-10%	26.51%	44.87%

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Note: The validation team has reviewed the invoices raised towards sale of single tube and double tube CFLs. It was noted that the actual selling prices does not cross the range of the sensitivity as tabulated above. Hence, the selling price considered for single tube CFL as INR 30 and Double tube CFL as INR 50 is appropriate.



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Scenario-3: Sale of Single tube CFLs (100% production capacity of BGPL) at a price of INR 30 against IL with a prevailing market price of INR 15 per IL.

	Variation	Project IRR of CFL (Project Activity)	Project IRR of IL (Baseline)
Actual		27.77%	40.84%
Production Capacity	+10%	31.08%	48.40%
	-10%	23.76%	33.54%
Raw material price	+10%	26.15%	38.85%
	-10%	29.06%	42.79%
Project cost	+10%	25.40%	37.46%
	-10%	30.54%	44.87%

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The validation team observed that the actual project cost incurred by the project participant is more than the estimated project cost¹³. The actual project cost incurred by the project participant is INR 2355 lacs (which is 4.32 % more than estimated project cost) and interest rate is 15%. The IRR of the project at this project cost and interest are as follows:

S.No	Scenario	IRR of the project
1	Project Conceptualization (Scenario 1)	#DIV/0!*
2	Project scenario considering sale of single tube CFLs @ INR 30 and double tube CFLs @ INR 50 ¹⁴ (Scenario 2)	23.97%
3	Project scenario considering sale of single tube CFLs @ INR30 ¹⁵ (Scenario 3)	27.77%

* #DIV/0! shows IRR value is less than zero i.e. negative cash inflow.

The validation team observed that although PP decided to take INR 4.5 and INR 10 per single and double tube CFL respectively, the sensitivity analysis for this is not significant as the PP has carried out sensitivity analysis for INR 30 and 50 for Single tube and double tube CFLs, which gives higher revenue to PP.

Hence, from the above sensitivity analysis, the validation team confirms that even in case of $\pm 10\%$ variation in the parameters the Post tax Project IRR for the project activity does not meet with the baseline post tax project IRR. Hence, the proposed project activity is additional.

CAR-19 was raised as following was not clearly described in the PoA DD:
1) use of investment comparison analysis was not justified 2) Cost of CFL

¹³ Certificate of actual project cost issued by Chartered accountant. Mr. Sridhar dated 31/10/2009 for production line -1 and dated 17/02/2011 for production line - 2.

¹⁴ This scenario includes 15% production of single tube CFL and 85% production of double tube CFL.

¹⁵ This scenario includes 100% production and sale of single tube CFLs only as the most conservative scenario.



was not consistent in the PoA-DD, 3) Financial indicator was not clear. 4) Financial calculations provided were for 10 years only 5) Sources of input values were not mentioned in entire financial sheet. PP in response corrected the financial sheet and provided justification of investment comparison in the PoA-DD, cost of CFL was made clear as 'Free' at the time of implementation of PoA. The PP also clarified that the financial indicator is Project IRR and corrected the financial calculations till 20 years, also all the sources for the input parameters are now correctly mentioned in the financial sheet. Having reviewed this, validation team closed the CAR.

CAR-20 was raised as, The values used in the PoA-DD were not consistently mentioned as in the Techno Economical Viability Report. The complete presentation of the results of investment analysis are not according to the Techno-Economic Viability Study Report. PP in response corrected the values of input parameters in accordance with the Techno-Economic Viability Study Report and corrected the Financial sheets in accordance with the guidelines of CDM EB for additionality, calculations are now represented for 20 years, i.e. till the life time of the PoA. Validation team reviewed this and find appropriate, hence, closed the CAR.

CL-33 was raised as in the investment analysis sensitivity on production of CFLs was not demonstrated. In response to this, the PP provided the financial spreadsheet wherein sensitivity on production of CFLs is carried out, hence, CL was closed.

3.7.4 Barrier analysis (118)

This is a small scale project, Project participant has used investment barrier and has demonstrated additionality as explained above in section 3.7.3. PP has not conducted any other barrier analysis to prove the additionality.

3.7.5 Common practice analysis (121)

Common practice analysis has not been used to demonstrate additionality. As per Attachment A to Appendix B of Simplified modalities and procedures for small scale CDM project activities, additionality can be demonstrated by any one of the four barriers listed. Project participant has demonstrated additionality using investment barrier only.

3.8 Monitoring plan (124)

The Project uses the approved consolidated monitoring methodology AMS II C Version 13 applied.

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The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible and complying with the requirements of the applied methodology are described below.

Following parameters are to be monitored for emission reduction calculations:

1. I is Number of different wattage CFLs installed; would be monitored and record of the same will be through the distribution data. This can be checked by the distribution data of each CPA and can be cross checked with the order instruction for each CPA released to production.
2. n_i is Number of CFLs of each wattage distributed in SSC-CPA region; would be monitored and record of the same will be through the distribution data. This can be checked by the distribution data of each CPA and can be cross checked with the order instruction for each CPA released to production.
3. p_i is Wattage of CFLs distributed in the particular CPA; would be monitored and record of the same will be through the distribution data. This can be checked by the distribution data of each CPA and can be cross checked with the order instruction/survey data sheet for each CPA released to production.
4. o_i is Operating hours of CFL; which would be monitored through runtime meter based on sampling as explained in section A.4.3 of the PoA-DD. Since, the no. Of CFLs would be in bulk quantity, the PP wishes to adopt sampling. This is done in line with the EB 50 Annex 30 and EB 65 Annex 2 by the PP.

Supprimé: $<\#>Q_{CFL,propane}$ is kg of propane per CFL manufactured; would be monitored and record of the same will be cross-checked with the propane bills and production capacity for a given time period. $I_{E_{CFL}}$ is import of electricity consumed for manufacturing one CFL; would be monitored and record of the same will be cross-checked with the monthly electricity bills and projection figures of the CFLs.

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Sampling for 'run time meter'

The PP has adopted the stratified random sampling for 'clusters'. The clusters identified as residential consumers, industrial consumers and commercial consumers. Each cluster will have 'metered samples' and 'non-metered samples' PP intends to use software to determine sample size in the cluster. As per the EB 50, Annex 30 and EB 65 Annex 2, following (and not restricted to) weblinks/softwares can be used by the PP for determining the sample size.

<http://www.raosoft.com/samplesize.html>
<http://www.hcp.med.harvard.edu/statistics/survey-soft/#Online>
<http://www.freestatistics.info/stat.php>

The PP in the PoA-DD has illustrated an example using the <http://www.raosoft.com/samplesize.html> software, which is one of the software suggested by EB, hence, accepted by the validation team.



As explained in the PoA-DD, for the total population of CFLs, PP will install meters on some of the CFLs based on sampling. Hence, there will be two types. 1) Metered Sample CFLs and 2) Non-metered Sample CFL.

Metered sample: A metered sample will be identified to monitor the number of operating hours of the CFL usage. In order to measure the number of hours of CFL usage, runtime meters will be installed on sample number of CFLs and recorded as per the methodology. These samples are termed as 'metered samples'.

The project participant will use the stratified random sampling method to determine the sample of CFLs for measuring the operating hours of installed CFLs under the SSC-CPA. The sample will be chosen so as to achieve 90% confidence interval with 10% error margin. The sampling will be done in two stages.

Stage 1:

In the sampling method, the region would be divided into different strata (say, for example, residential, commercial shopping, office space, etc). This is because; the CFLs distributed to different strata will greatly differ in their hours of CFL usage due to varying operational patterns. Each type of place will form a stratum. The number and types of strata (subgroups) will be categorized based on the distribution data.

Each element in the stratum is given a unique number (for example, residences are given a number from 1 to 10 in the subgroup of residences). Using the above mentioned web link/software packages number of samples required to monitor would be derived for each stratum. A set of random numbers corresponding to the number of sample would be identified using the excel function RANDBETWEEN() in each stratum (i.e., for example, if 100 is number of samples to be monitored in a stratum of population 100,000 then randomly 100 houses would be identified in the population).

Stage 2:

The sample is drawn from the population as described in stage-1. Each location in the sample may have one or more CFLs installed at the distribution stage. The CFLs installed in each location are numbered and one CFL per location is randomly selected using the excel function RANDBETWEEN(). As a result, we have sampled number of CFLs where the metering will be done for a period of ninety days.

The runtime meters will be installed in the sample locations for a period of ninety days. The meters will be shifted periodically to newly selected CFLs as per the above procedure to account for the seasonal variations.



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The records for the meter readings will be maintained for the crediting period and an additional two years.

Non-metered sample: A non-metered sample will be identified (identified similar to the metered sample) to find number of operating CFLs in the SSC-CPA. In order to monitor the number of operating CFLs at the end of each monitoring period, a sample number of CFLs will be checked to determine the percentage of inoperative CFLs. Since no metering is involved for this survey, this sample is termed as 'non-metered sample'.

Information like the period during which the CFL has been inoperative will be collected, recorded and a suitable discounting factor will be used to reduce the emission reductions.

Validation team agrees to this approach because:

- ➔ The sample size will be determined based on the 'Standard for sampling and survey for CDM project activities and Program of Activities version 2, Annex 3, EB 65.
- ➔ The sample will be drawn to achieve 90% confidence interval with 10% error margin, which is in accordance with the EB guidelines for sampling viz. EB 50 Annex 30 and EB 65, Annex 3.
- ➔ A random sample of places will be drawn annually to verify the continued usage of CFLs. The sample is randomly selected from the population using the excel function RANDBETWEEN(). The sample number of locations will be monitored annually to check whether the CFLs are operating. The sample locations are changed every year.
- ➔ The PP intends to use the software suggested by EB.
- ➔ An illustration of sampling has been explained in the PoA-DD by the PP.

Hence, from the above description, validation team confirms that due to large no. of CFLs to be used in the CPAs, the approach of 'sampling' to represent total population is correct. Also the method used for sampling is as per the guideline provided by EB for 'sampling', hence acceptable.

It is clarified in the PoA-DD that the runtime meters will be installed on a sample of CFLs in one SSC-CPA. (Sample size will be decided as described above). The same run time meters will be rotated to a different sample of the same CPA after a period of ninety days¹⁶. This will be

¹⁶ The working conditions of the runtime meters would be periodically checked (after end of each cycle of 3 months). Moreover, the data from the runtime meters would be manually downloaded every month. This would further enable the project participant to check operating conditions of the runtime meter. If the runtime meter becomes defective, the meter would be immediately replaced with a new meter. If a meter is found to be defective during the monitoring period then the readings of the same will not be considered for calculation of actual CERs.



repeated¹⁷ until the completion of the monitoring period of the SSC-CPA which may be the CFL lifetime installed in the SSC-CPA region or the crediting period specified for that particular SSC-CPA, whichever is the shorter period. However, after the completion of the monitoring period for that particular SSC-CPA, the run time meters can be used for another SSC-CPA within the PoA. The meter would be able to record Voltage, Current energy and usage hours with switch on time stamp.

The runtime meters which are being planned in the CPA would typically have 3 types of data sharing mechanism viz., through saving data in non-volatile memory, through a PC interface connected to microcontroller and through a GSM module. During every switch-on of the lamp the GSM module would send data for the previous cycle through SMS to a wirelessly connected server located either at BGPL or any third party appointed for the purpose. A PC interface will be available which can be connected to the runtime meter through a USB Dongle. In case of any damage to the runtime meter, the data can be downloaded from the internal memory of runtime meter. The runtime meter also has an internal memory of 16MB which has a life of 10 years. All the data stored in the memory can be downloaded to a wireless device, whenever required.

The above monitoring parameters are as per the requirement of monitoring methodology particularly para 12, which says *"If the devices installed replace existing devices, the number and "power" of a representative sample of the replaced devices shall be recorded in a way to allow for a physical verification by DOE."* Accordingly, the PoA-DD describes record keeping of 'wattage' of replaced IL CFL and no. of hours are measured through run-time meter, hence, it meets the requirement of Para 12 of the monitoring methodology.

CAR 11 was raised as discrepancies were observed in the web hosted PoA-DD regarding measurement methods, QA/QC procedure, non-inclusion of value of data, Non-adequate description of roles and responsibilities, non-involvement of some of monitoring parameters at manufacturing plant, discrepancy in location of manufacturing plant, non-inclusion of Accuracy, range & specification of run time meter. Also, compatibility of 'run time meters' with BGPL make CFL was not clearly mentioned to avoid use of other type of CFLs by users in case of damage/nonworking of BGPL bulbs. Validation team also raised point as seasonal variation was not considered for keeping runtime meter at a particular place. PP in response, corrected the monitoring plan and revised the measurement method, QA/QC procedure, included parameters of manufacturing facility, clearly described the role and

¹⁷ The runtime meter being used for the sampling would be replaced before the end of its life for future analysis. For example, if a meter has been used for operating life of 4 year 11 months, then such meters would not be used for further installations.



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responsibilities, included accuracy, range and specification of run time meter. For the Compatibility of run time meter with CFLs manufactured by PP, it was clarified that 'run time meter' will be installed in such a fashion that, sealing mechanism of the runtime meter will be used. The run-time meter would be installed with proper sealing mechanism (typically sealing mechanism will consist of a one-time adhesive tape/sticker which would be stuck on the holder, runtime meter and CFL). A unique number corresponding to the electricity meter number along with date of the start of monitoring period in the sample location will be mentioned on the seal. Once a CFL is fitted to the runtime meter for monitoring, the owner of the house/building will not be able to detach the run time meter from the project CFL and use it with any other CFL. In case of any failure of CFL lamp or if it is observed in the non-metered sampling that the seal is broken at the end of monitoring period, it will be recorded and accounted proportionately in estimating the actual number of CERs. If say, for an example, a 5% of lamps are found to be non-operational during non-metered sampling then proportionately 5% of CERs would be deducted for the monitoring period. For the seasonal variation, it is clarified that the 'run time meter' will be fixed/installed at four different locations within a SSC-CPA region (i.e. minimum 90 days x 4 locations), which captures seasonal variation in a year. The PP also reported that in a house/shop/user's end there might be a combination of CFLs of the same CME in form of 'free' distributed and 'sold' CFLs. However, they can be accurately identified and differentiated by means of unique identification number provided on 'free' distributed CFL. The 'sold' CFL would not have such unique identification number at all. The unique identification of project equipment is explained in 'eligibility criteria' of the PoA and CPA validation report. For the 'sold' CFLs, Scenario 2 or Scenario 3 as explained in the additionality section of PoA DD is applicable. There is no separate monitoring required for 'sold' CFLs as scenario 2 and 3 considers 100% sale of CFLs. Even with this, the project is additional. Having reviewed the corrections in the PoA-DD, validation team finds this as appropriate, and feasible, hence, closed the CAR.

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CAR 22 was raised as clear description of the monitoring plan in line with Para 11 to 17 was not described in the PoA-DD e.g. the scrap mechanism was not adequately described in the PoA-DD. PP in response, now described the scrap mechanism procedure in section A.4.2 Para 10, validation team reviewed this and finds this as appropriate and in line with the Para 11-17 of the methodology, hence, CAR is closed.

CAR 4 was raised as it was indicated in the PoA-DD that the PP wishes to use sampling techniques for the 'run time meters' for measurement of 'operation hours' of the CFL. However, the same was not explained explicitly in the PoA DD. The PP in response, described the sampling in



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the PoA DD in section A.4.2. The same is in accordance with EB 50, Annex 30 and EB 65, Annex 2, hence, the validation team accepted this. The validation team validated the metering system at site as follows viz.;

Description of electricity meter and electricity consumption at end user and, 'Run time' meter calibration is provided.

- a. There are bi-directional tri-vector energy meters of accuracy class 0.2s installed at the substations from where feeders are further taken to load centers.
- b. Average annual technical grid losses will be a monitoring parameter. In the calculation of the baseline and project emissions during the crediting period, if any recent data is available for the grid in the SSC-CPA region for technical losses in the grid, the same would be used. In the absence of availability of such data, the project participant intends to use the default value of 0.1. (This is as per methodology)
- c. No. of CFLs of each type and the wattage of CFLs in the project will be as per capacity and would be monitored based on distribution data in the CPA
- d. No. of average operating hours each type of CFLs will be monitored by means of 'Run time meter' as explained above, having accuracy $\pm 1\%$.

Supprimé: , diesel monitoring meter, propane monitoring meter is to be written here.

Supprimé: <#>The quantity of propane measurement is by means of plant log records for a batch of CFLs manufactured. This will be cross-checked with the propane bills and production capacity for a given time period available with the project participant.¶

Validation team confirms that the description now correctly represents the metering system available at the project activity site.

The validation team therefore is of the opinion that the project participant is capable of implementing the monitoring plan in the context of the project activity. The validation team hereby confirms that the monitoring plan described in the revised PDD complies with the requirements of the methodology.

3.9 Sustainable development (127)

The host Party's DNA confirmed the contribution of the project activity to the sustainable development of the host Party. Refer to item 3.1 of this report. The project participant described the contribution of the project activity to sustainable development as per four indicators of sustainable development stipulated by Ministry of Environment & Forests in India.

The host country legislation does not require any environmental impact assessment to be carried out for similar type of projects. Project participant has obtained approval (Ref /7/) from the respective DNA and it is confirmed by the authority that the project contributes to sustainable development in the respective regions. The project activity is in compliance with all current applicable legislations. As the project activity



does not lead to generation of liquid or gaseous effluents and it will partly displace fossil fuel based electricity generation, there are only benefits derived out of the project and no adverse effects are envisaged.

In the section C.1 of the web hosted PoA-DD, PP clarified that a third party analysis of the potential environmental hazard involved in the process of CFL manufacture has been carried out. However, evidence for the same along with mitigation plan/measures taken to avoid the hazards were not provided to validation team, hence CL 14 was raised. The PP in response provided a copy of "Hazard Analysis Risk Assessment" study conducted by third party M/s. Surya System Safety Services Pvt. Ltd., Secundarabad in year 2008 (Ref /33/). PP has in the revised PoA-DD described its mitigation actions in Section C.2 of the revised PoA-DD, hence, CL is closed.

During the site visit, it was noticed that the project activity provided employment to local people. The host Party's DNA confirmed the contribution of the project to the sustainable development of the host Party. Please refer to section 3.1 of this report.

3.10 Local stakeholder consultation (130)

The steps taken to assess the adequacy of the local stakeholder consultation are described below.

Local stakeholder consultation meeting to discuss stakeholder concerns on the Project Activity was held on 07/03/2009 at the manufacturing facility at Nandikandi Village PP submitted the Minutes of Meeting (Ref /29/). A questionnaire was also distributed to the identified stakeholders along with the invitation to collect their comments and feedbacks with respect to the project activity on (Ref /29/). The stakeholders invited for the local stakeholder meet were Village sarpanch (Head of the village), Andhra Pradesh Pollution Control Board (APPCB) officials, Personnel involved in the plant, Contractors associated with the plant, Local Villagers. The meeting was held on 07/03/2009. The validation team feels that the time provided to the local stakeholders for providing comments on the Project Activity is adequate.

The attendance list of participants, invitation letter along with questionnaire to interested stakeholders, and minutes of the stakeholder meeting proceedings, maintained by the project participants (Ref /29/) were verified by the validation team. The stakeholders viewed this project as contributing to local environmental benefits and socio-economy. Overall, there was agreement that the project activity was a beneficial project from the local sustainable development.



During the validation site visit, the validation team also interviewed few of the local stakeholders for their views about the project activity. The villagers confirmed that the earlier local stakeholder consultation meeting was held at the manufacturing plant at Nandikandi village. The villagers expressed satisfaction over the proposed project activity in the region and confirmed that due to the project, there is no adverse effect or damage to land, vegetation etc. It was expressed that the project activity gives employment opportunity for the local public and thus contributes to the economic growth of the region. The validation team also observed that the local people have been provided employment at the manufacturing facility.

CAR-15 was raised as choice of local stakeholder consultation process at PoA level was not justified; also it was not transparently mentioned whether sufficient time was provided to the local stakeholders to provide their comments. The PP in response corrected section D.2 of the PoA-DD, justified the choice of doing local stakeholder consultation at PoA level stating the project activity is "Manufacture and Distribution of CFLs in India), hence mainly affected area is due to manufacturing, hence, consultation was done at PoA level. The validation team reviewed this and found that argument of doing stake holder consultation at PoA level is acceptable, also the time given for the local stake holder consultation is appropriate for comments, hence, CAR is closed.

From the above description and various CARs/CLs raised by validation team and having reviewed PP's response and corrections in the PoA-DD, the validation team hereby confirms that the process of local stakeholder consultation is observed to be adequate.

3.11 Environmental impacts (133)

As per the Schedule of the EIA notification (Ref /B9/), given by the Ministry of Environment and Forests (Government of India) EIA is not a regulatory requirement in India for similar type of projects. Thus the project activity doesn't require EIA. The project activity does not involve any negative environmental impacts, as the project activity involves the replacement of the existing transformers and cables with new ones.

Project participant has obtained HCA approval (Ref /7/) from the respective DNA and it is confirmed by the Authority that the project contributes to sustainable development in the respective regions. The project activity is in compliance with all current applicable legislations.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PoA-DD, generic CPA-DD and specific CPA-DD using methodology AMS II C, version 13 was webhosted on the UNFCCC for global stakeholder's comments as per CDM requirements. The project was



webhosted from 10/04/2010 to 09/05/2010. No comments were received from the global stakeholders for the proposed project activity.

5 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the PoA Project of M/s. Balaji Greentech Products Ltd, entitled "Manufacture and Distribution of CFLs" whose manufacturing plant is located at Nandikandi village, Sadashivpet mandal, Medak district of Andhra Pradesh. The distribution of CFLs is intended throughout India, under the context of various Component of Project activities (CPAs). The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Project participant/s used the Attachment A to Appendix B for demonstration of the additionality. In line with this tool, the PDD provides analysis of investment to determine that the project activity itself is not the baseline scenario.

By synthetic analysis of the description of the project, the project is likely to result in reductions of GHG emissions. An analysis of the investment barrier demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The review of the revised project design documentation (Ref /4/ to /6/) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Bureau Veritas Certification thus requests registration of PoA Project of M/s. Balaji Greentech Products Ltd. titled "Manufacture and Distribution of CFLs in India" whose manufacturing plant is located at Nandikandi village, Sadashivpet mandal, Medak district of Andhra Pradesh.



6 REFERENCES

Category 1 Documents:

Documents provided by M/s. Balaji Greentech Products Ltd. that relates directly to the GHG components of the project.

/1/	Webhosted POA DD, Version 1, dated 10/12/2008
/2/	Webhosted Generic CPA-DD, Version 1.0, dated XX/XX/XXXX
/3/	Webhosted Specific CPA-DD, Version 1, dated 19/12/2008
/4/	Final POA DD, Version 6, dated 21/09/2012
/5/	Final Generic CPA- DD, Version 6, dated 21/09/2012
/6/	Final Specific CPA-DD, Version 6, dated 21/09/2012
/7/	Host Country Approval issued by the DNA of India vide reference no. 4/10/2010-CCC dtd. 28-September-2010 for the proposed project activity.
/8/	Page 15 of Web site showing the Life time of CFL http://www.es.e.iitb.ac.in/~suryad/Lighting-CEP.pdf
/9/	Website showing the energy consumption of CFL as one-fifth than Incandescent Lamp (IL) http://emt-india.com/BEE-BLY/BhachatLampYojna.pdf
/10/	Board note dated 22/06/2009 where board decision is taken as "Free Distribution of CFLs instead of INR 15"
/11/	Board note dated 22/07/2009, where board decided to sale CFLs at a cost of INR 30 for Single Tube CFL and INR 50 for Double Tube type CFL to meet the working capital requirement for the operation of the manufacturing plant.
/12/	Board note dated 24/07/2009, where board decided to sale parts of CFLs at a cost of INR 4.50 for Single Tube CFL and INR 10 for Double Tube type CFL to meet the working capital requirement for the operation of the manufacturing plant.
/13/	Purchase Order raised on M/s. Precision Engineering Works, ref. no. BGL/002/8-09 dtd. 16/04/2008
/14/	Prefeasibility report for production of Incandescent bulbs by M/s. B. Nagabhushan & Co. in year 2008
/15/	Techno Economic Viability Report for production of CFLs by M/s. B. Nagabhushan & Co. in year 2008
/16/	CEA report showing Density & NCV of diesel and Emission factor of diesel report on web site http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
/17/	CEA report for Grid Emission factor form the website http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
/18/	Baseline data of CPA including consumer no, name and address of consumer, No., wattages of Incandescent lamps & empty

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	holders & usage hours of ILs in the baseline in excel spread sheet "Baseline Survey"
/19/	Estimated Emission reduction spread sheet in first CPA i.e. at Village Gollaguda
/20/	Spread sheets showing the financial calculations at different revenue model (20a) Financial sheet for the Scenario – 1 –“Free distribution of CFLs for the replacement of IL with a prevailing market price of INR 15 per IL.” (20b) Financial sheet for the Scenario – 2 “Sale of Single tube CFLs (15% of production capacity) at a price of INR 30 and Double tube CFLs (85% of production capacity) at a price of INR 50 against IL with a prevailing market price of INR 15 per IL.” (20c) Financial sheet for the Scenario – 3 “Sale of Single tube CFLs (100% production capacity of BGPL) at a price of INR 30 against IL with a prevailing market price of INR 15 per IL”
/21/	Appointment of consultant for the Prefeasibility report on Manufacture and distribution of IL and For the Techno-economic Viability Report of Manufacture and Distribution of CFLs in India. Dtd. 21/11/2007
/22/	Board note dtd. 20/03/2008, considering CDM revenue as decisive factor and appointing one of the board member as ‘decision authority’ for the PoA related decisions
/23/	Loan application from PP to the State Bank Of Hyderabad dtd. 09/02/2008 for the proposed PoA
/24/	Loan sanction letter from the State Bank of Hyderabad vide its letter no. F/ADV/Balaji Greentech/8 dtd. 16/04/2008
/25/	Clarification from State Bank of Hyderabad, stating that while sanctioning the loan, it has considered CDM revenue for the proposed CDM PoA, vides its letter no. F/OSB/Balaji Greentech/674 dtd. 02/05/2008
/26/	Appointment of CDM consultant letter dtd. 21/10/2008
/27/	Intimation to UNFCCC by the PP for the Proposed PoA for serious prior consideration
/28/	Stakeholder consultation intimation notice dtd. 11/02/2009
/29/	Stakeholder consultation meeting on 07/03/209- MOM thereof.
/30/	Appointment of DOE on Dt. 12/01/2009
/31/	Quotation letter from M/s. Precision Engineering works dtd. 21/11/2007 for the manufacturing of CFL
/32/	Quotation letter from M/s. Precision Engineering works dtd. 21/11/2007 for the manufacturing of Incandescent lamps.
/33/	“Hazard Analysis Risk Assessment” study conducted by third party M/s. Surya System Safety Services Pvt. Ltd., Secundarabad in



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	year 2008
/34/	India's situation of peak power deficit, website referred http://www.cea.nic.in/god/gmd/lqbr_report.pdf , Annex II, Annex III
/35/	National Physical Laboratory certificate demonstrating 'test for lifetime of CFL' i) 9W – 09050174/1.04/83 dtd. 17/09/2009 and 31/03/2010 ii) 15 W – 08121405/1 .04/140 dtd. 15/06/2009 and 11/12/2009 iii) 20 W – 08121405/1.04/141 dtd. 15/06/2009 and 11/12/2009
/36/	Indian standard- IS 418:2004 “ Tungsten Filament lamps for domestic and similar general lighting purposes”
/37/	Indian Standard – IS 15111 (Part 2): 2002 “Self Ballasted lamps for general lighting services”
/38/	Delivery Challans for Supply of Plant and Machineries for manufacturing of CFLs by Precision Engineering works
/39/	Original invoices issued by Precision Engineering works for Supply of Plant and Machineries for manufacturing of CFLs by
/40/	Certificates of actual project cost issued by Chartered accountant. M/s. V. Sridhar & Co. dated 31/10/2009 for line-1 and 17/02/2011 for line-2.
/41/	Data base published by Central Electricity Authority for the generation scenario in India
/42/	Plant records for the production CFLs
/43/	Chartered Accountant certificate for the value of asset capitalization of the land

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Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/B1/	POA DD completion guidance - Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM), version 05
/B2/	AMS II. C, Version 13 - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories
/ B3/	Guidelines On Assessment Of Debundling For SSC Project Activities, version 3, EB 54, Annex 13
/ B4/	Emission Factor tool - Tool to calculate the emission factor for an electricity system, version 2.2.1, EB 63, Annex 19
/ B5/	Validation and Verification Manual, version 1.2, EB 54; [VVM]



/ B6/	CEA baseline database, version 04 [http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm]
/ B7/	Guidance on the Assessment of Investment Analysis, Version 05, EB 65, Annex 21
/ B8/	Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM, Version 04, EB 62, Annex 13
/ B9/	EIA notification, S.O. 1533 dated 14th September, 2006
/B10/	Indian Standard : 15111: Self Ballasted Lamps for General Lighting Services
/B11/	General Guidance to SSC CDM methodologies, EB 61, Annex 21
/B12/	Guidelines for the assessment of investment analysis, EB 62, Annex 5

Persons interviewed:

List persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

/1/	Mr. A. Prathap Reddy, Managing Director, BGPL
/2/	Mr. Hemanth Reddy, Director, BGPL
/3/	Mr. N. Narayana, Executive Director, BGPL
/4/	Mr. Praveen K., General Manager – Works, BGPL
/5/	Ms. Mansi Agrawal, Consultant, Ernst & Young Pvt. Ltd.
/6/	Ms. Raghvendra Mysore, Consultant, Ernst & Young Pvt. Ltd.
/7/	Mr. Krishna Chaitanya D., Consultant, Ernst & Young Pvt. Ltd.
/8/	Mr. Pentaiah (Local Stakeholder, Villager – Village Nanikandi)
/9/	Mr. Ramlu (Local Stakeholder, Civil worker–Village Sadashiv Pet)
/10/	Mr. V. Siddharam Reddy (Civil Supervisor , Village Siddhapur)



7. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Bhavesh Prajapati (Team Leader)

Bureau Veritas Certification, Lead Verifier - Climate Change

Graduate in the field of Chemical Engineering and post graduate in finance (MBA-Finance). He has more than 8 years of Industrial work experience in the field of environment audits, consultancy of HVAC (pharmaceutical industry as well as commercial air conditioning) and utility services and project management of various Greenfield as well as gray field projects. He has undergone lead verifier's training on Clean Development Mechanism. He is involved in the Validation/verification projects of CDM and VCS.

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Sanjay Patankar

Bureau Veritas Certification

Educational qualifications: B.E. (Mech.) M.E. (Mech.)

He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. Working for the last 2 years in Bureau Veritas Certification (India) Private Ltd. as Lead Auditor for ISO 9001, 14001 and OHSAS 18001 standards/specifications. Has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of CDM project activities.

Hitesh Karandikar (Team Member)

Hitesh Karandikar is B.E. (Bachelor of Engineer) in Electrical Engineering. (1991 batch). He is an MBA in Marketing and Finance. He has worked in Gujarat Electricity Board of Gujarat state in various departments. He has worked at world renowned Hydro Power project viz. "Sardar Sarovar Narmada Nigam Limited". The power station has total capacity of 1450 MW generation capacity of which 250 MW from Canal Head Power House and 1200 MW from River Bed Power House. He has an experience of Designing switch Yard Structures, foundation for the 220 kv and 400 kv switchyard structures.

He is a certified Energy Manager from Bureau of Energy Efficiency, and has wide experience of preliminary energy audit of more than 200 industries. He was also a team mate from Gujarat Electricity Board, in carrying out thermal power energy audit carried out by NPC, Hyderabad and ERDA, Vadodara. He has been faculty in many "Energy Conservation" seminars/conferences. His other professional qualification includes: He is



a ISO 9001, 14001 and OHSAS 18001 Lead Auditor. (more than 200 manday audit experience). He is also a certified Six Sigma Black Belt. He has successfully undergone training of CDM verifier organised by Bureau Veritas.

Mr. Sushil Budhia

Sushil Budhia & Associates, Mumbai, Chartered Accountant Extensive experience in conducting statutory and tax audits. He has experience in internal audits and taxation matters.

H B Muralidhar (Internal Technical Reviewer)

Graduate in Electrical engineering with 25 years of experience power generation and distribution related fields as well as in management system auditing. He is the Lead auditor for Environmental Management System, Quality Management system and Occupational Health and Safety Management System. He has undergone intensive training on Clean Development Mechanism. He is the technical expert & conducted Validation / Verification for more than 50 CDM Projects.



APPENDIX A BALAJI GREENTECH PRODUCTS LIMITED, CDM POA VALIDATION PROTOCOL

TABLE 1 Validation requirement based on the Clean Development Mechanism Validation and Verification Manual (VERSION 01.2)

VALIDATION PROTOCOL

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1. Approval			COUNTRY A (India)	COUNTRY B (Not Applicable)		
a. Have all Parties involved approved the project activity?	VVM	44	The Project Participant description under Section A.3 of the POA DD indicates that Balaji Greentech Products Limited is the Project Participant. However the DNA approval for the Project Participant is not provided to the validation team. Also, it is not clear from the PDD section E.4 that only Balaji Greentech Products Limited is the Project Participant.	--	CAR-1	OK
b. Has the DNA of each Party indicated as being involved in the proposed CDM/POA project activity in section A.3 of the PDD provided a	VVM	45	Refer (1.a) above		-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
written letter of approval? (If yes, provide the reference of the letter of approval, any supporting documentation, and specify if the letter was received from the project participatn or directly from the DNA)					
c. Does the letter of approval from DNA of each Party involved:	VVM	45	Refer (1.a) above	-	-
i. confirm that the Party is a Party of the Kyoto Protocol?	VVM	45.a	Refer (1.a) above	-	-
ii. confirm that participation is voluntary?	VVM	45.b	Refer (1.a) above	-	-
iii. confirm that, in the case of the host Party, the proposed CDM/POA project activity contributes to the sustainable development of the country?	VVM	45.c	Refer (1.a) above	-	-
iv. Refers to the precise proposed CDM/POA project activity title in the PDD being submitted for registration?	VVM	45.d	Refer (1.a) above	-	-
d. Is(are) the letter(s) of approval unconditional with respect to (i) to (iv) above?	VVM	46	Refer (1.a) above	-	-
e. Has(ve) the letter(s) of approval been issued by the respective Party's designated national authority (DNA)?	VVM	47	Refer (1.a) above	-	-
f. If there is doubt with respect to (e) above, was verified with the DNA that the letter of approval is valid for the proposed CDM/POA project activity under validation?	VVM	47	Refer (1.a) above	-	-
g. Is there doubt with respect to the authenticity of	VVM	48	Refer (1.a) above	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the letter of approval?					
h. If yes, was verified with the DNA that the letter of approval is authentic?	VVM	48	Refer (1.a) above	-	-
2. Participation			<i>PP1 (Balaji Greentech Pvt. Ltd.)</i>	<i>PP2 (Not Applicable)</i>	
a. Have all project participants been listed in a consistent manner in the project documentation?	VVM	51	It is not clearly mentioned in line with guidance and form as who is coordinating and managing entity and who is Project Participant.	CL-1	OK
b. Has the participation of the project participants in the project activity been approved by a Party to the Kyoto Protocol?	VVM	51	Refer (1.a) above	-	-
c. Are the project participants listed in tabular form in section A.3 of the PDD?	VVM	52	Yes, project participant is M/s. Balaji Greentech Products Limited, as mentioned in PDD. However, refer (2.a) above.	-	-
d. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD?	VVM	52	Refer (1.a) and (2.a) above.	-	-
e. Has the participation of each of the project participants been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve	VVM	52	Refer (1.a) above.	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
participation? (Provide reference of the approval document for each of the project participants)					
f. Are any entities other than those approved as project participants included in these sections of the PDD?	VVM	52	No	OK	OK
g. Has the approval of participation issued from the relevant DNA?	VVM	53	Refer (1.a) above.	-	-
h. Is there doubt with respect to (g) above? I	VVM	53	Refer (1.a) above.	-	-
i. If yes, was verified with the DNA that the approval of participation is valid for the proposed project participant?	VVM	53	Refer (1.a) above.	-	-
3. Project design document – POA DD					
a. Is the PDD used as a basis for validation prepared in accordance with the latest template and guidance from the CDM/POA Executive Board available on the UNFCCC CDM/POA website?	VVM	55	Yes, the PDD used is in accordance with the latest template and guidance from the CDM/POA Executive Board available on the UNFCCC CDM/POA website. However, followings need to be responded: (1) It is observed that, the form is altered on the first page of POA – DD. (2) The PoA-DD was completed on 10 December 2008, where as the latest version, which is applied, is available after June 2009. Please clarify.	CAR-2	OK
b. Is the PDD in accordance with the applicable CDM/POA requirements for completing the PDD?	VVM	56	Refer (3.a) above	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. In CDM/POA-SSC-PDD section A.1 are following provided?					
i. Title of project			Yes. The title of project activity is mentioned as "Manufacture and Distribution of CFLs in India".	OK	OK
ii. Current version number and date of document			The version of PDD and date of PDD are mentioned as 01 and 10/12/2008 respectively.	OK	OK
d. In CDM/POA-SSC-PDD section A.2 are following provided?					
i. A brief description of the project activity covering purpose which includes the scenario existing prior to the start of project, present scenario and baseline			<p>The description of the project activity covers following points which require further clarification:</p> <ol style="list-style-type: none"> 1. Life of the ILs could not be found in reference "1" provided in PDD. 2. It is stated that CFL consumes up to one-fourth of power of equivalent ILs. Please provide evidence for this and substantiate the same. 3. Clarify the areas where BGPL is planning to distribute CFLs. Also, implementation plan is not clearly described i.e. series of activities leading to distribution of CFLs of BGPL. 	CL-2	OK
ii. Explanation how the GHG emission reductions are effected			<p>The explanation of how the project activity would help in GHG emission reductions are explained in Environmental well being section.</p> <p>However, following points are not clear in terms</p>	CL-3	OK



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			of how the GHG emissions are effected. PDD mentions "Decrease in usage of grid power reduces usage of fossil fuels and green house gas emissions in the electricity grid: Description of how this green house gas emission in the electricity grid is not evident in the PDD for Environmental Well Being.		
iii. The PP's view on the contribution of project activity to sustainable development			PP's view on the contribution of project activity is not clear in following points. 1. First three points of Social Well Being are not clear with respect to social well being in the region. 2. It is stated that the penetration rate of CFL in India is very low. Provide some statistics with respect to time and penetrated quantity in Technological Well Being. 3. It is stated that: "The CFLs distributed in the PoA would have minimum quality standards.... ✓ Power factor of 0.8 more ✓ Minimum rated lifetime of 6,000 hrs" Provide evidences for the validation test reports/tests conducted.	CL-4	OK
iv. Are the following information provided viz;					



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. General operating and implementing framework of PoA. 2. Policy/measure or stated goal of the PoA. 3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.			Yes, however the followings need further clarifications: 1) Policy/measure of stated goal of the PoA: It is stated in PDD that: CFLs and their distribution in selected areas in India at a cost lower than the prevailing market price" Pl. clarify ho PP ensure that this will be same through out the project life? 2) Voluntary action: It is stated that there is no mandate of usage of CFLs in India but the Project Participant is involved in mfg and distribution of CFLs. Please explain how the voluntary participation in established.	CL-5	OK
e. In CDM/POA-SSC-PDD section A.3 are following provided in the tabular format?					
i. Coordinating or managing entity of the PoA as the entity which communicates with the Board.			Refer (2.a) above	-	-
ii. Identification of host party			Yes, Host Party is identified is mentioned as Government of India in PDD.	OK	OK
iii. Indication whether the Party wishes to be considered as project participant			Yes. Indicated that the party does not wish to be project participant.	OK	OK
iv. Project participants being registered in relation to PoA			The Project participant name is not clearly described in PoA-DD and in CPA-DD.	CAR-3	OK
f. In CDM/POA-SSC-PDD section A.4. are					



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
following provided?					
i. Location of the POA ?			Yes, the location of PoA is India (whole the country)	OK	OK
ii. Detailed physical location with unique identification of the project activity (eg. Longitude/latitude)			Yes, since the PoA is for whole the country i.e. India, Lat – long of India is provided.	OK	OK
iii. In Section A.4.1.2, is the physical / geographical boundary described ?			The physical boundary of India is described by means of map. However, the map is not clear, also, there are differences found in map for CDM-SSC-PoA and CDM –SSC-CPA and Specific- CPA map. Also, the format of Lat – long is different in SSC-PoA and SSC-CPA and Specific- CPA.	CL-6	OK
g. In CDM/POA-SSC-PDD section A.4.2 are following provided			<p>Following points require clarifications in CDM PoA DD, section A.4.2 :</p> <ol style="list-style-type: none"> 1. In point no. 2: in PoA DD mentions “The project proponent may employ a third party agency to carry out the baseline survey of the selected region. – Clarify for qualification criteria / minimum education / training for third party agency / people employed by third party agency. 2. Point no. 3: It is stated that “ the disposal of the ILs will be done according to the prevailing standard practice for which adequate records will be maintained and made available to the DOE” – Please 	CL-7	OK



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>specify/clarify what is the standard practice for disposal of ILs in India. Also, describe the approach that will be adopted for collection and disposal of used ILs that are replaced by CFLs.</p> <p>3. Point no. 4: It is mentioned that “ The CPA implementer will either distribute the CFLs for free or attach a minimum cost to the CFLs” what is the minimum cost considered for each CFL type, pl. clarify. It was observed during site visit of validation team that first CPA as decided by BGPL i.e. Village Gollaguda is surveyed and free distribution of CFL is planned. Please clarify.</p> <p>4. Point no. 6 : It mentions -installation of run time meters for 3 months at one place and after this period they will be installed at other place, to know the effect of climatic changes on the CFL usage. – During site visit of validation team it was discussed that this run meters are dedicated to each CPA. Also, clarify technical details including accuracy and calibration of these meters. Also, Disposal/reuse of this ‘metered sample 100 nos. CFLs’ is not clearly described in</p>		



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>PDD.</p> <p>5. Point no. 6: It is mentioned in PDD that sampling will be for 100 nos. of representatives. 100 nos. of representative samples does not clarify whether they are of same wattage or different.</p> <p>6. Point no. 6: PDD doesn't describe compatibility of BGPL make CFL and 'run time meter'. What if another make CFL is used by user, is not clear for working of 'run time meter'. . Also, it is not clearly stated how PP will ensure that CFLs manufactured by them only will be used in each CPA and the end user will use no other brand after distribution of CFL. This is very much probable in case if the distributed CFL stops working and the end user procure CFL from retail market.</p> <p>7. In general, description of point no. 4, 5, 6 and 7 of section A.4.2 of SSC-POA-DD is not synchronized for over all process to be adopted by PP for baseline survey for each CPA, distribution of CFLs, collection and disposal of replaced ILs, sampling and/or survey for both implementation as well as ex post monitoring and installation</p>		



VALIDATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>of CFL with run time meters.</p> <p>8. It is stated that the energy savings of SSC-CPA will not exceed 60 GWh. This is to be demonstrated with credible supportive. Also, it is stated that POA can be implemented by Project Participant or other parties. Please clarify what role does other party play.</p> <p>9. The title of project activity involves manufacture and installation of CFLs. However, entire description of implementation and monitoring of CPA in section A.4.2 is focused on distribution only. Please clarify.</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. In Section A.4.2.1, is the description of the technology or the measures to be employed by the SSC-CPA provided ?			<p>Yes, in the SSC-PoA-DD, description of the technology or measures to be employed is described. However the following needs further clarity viz. PDD states;</p> <ol style="list-style-type: none"> 1. RoHS directive for use of mercury 0.1% as mentioned in PDD. – Provide all RoHS directive applicable and procedure followed. 2. The manufactured CFL comply IEC standard, thus also Indian standard – clarify which IEC and Indian standard is followed and what are the conditions to be followed as per standards. Also provide evidence for the same 3. With reference to above point, the CPA implementation and monitoring is focused only on distribution of CFL. The technology described is for manufacturings of CFL. Please clarify how manufacturing reduces GHG emissions. 4. Please explain the relevance of working principle of CFL in this section of SSC-POA-DD. 	CL-8	OK
ii. In Section A.4.2.2, is the eligibility criteria for inclusion of a SSC-CPA in the POA described ? (Only description of the criteria for enrolling			Yes, the eligibility criteria for the inclusion of each SSC-CPA is completely described in the SSC-PoA-DD.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the CPA to be described)					
h. In CDM-POA-SSC-PDD section A.4.3 has it been demonstrated that:			1. It is mentioned that there are no policy and/or regulation for usage of CFLs and hence the project activity is voluntary action by Project Participant. Please explain how the voluntary participation is established for Balaji Greentech as project participant.	CL-9	OK
i. The proposed PoA is a voluntary coordinated action;			2. Refer to (i) above.		
ii. If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;			3. Non-applicability of "If the PoA is implementing a mandatory policy / regulation, this would/is not enforced" is not described.		
iii. If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;			4. Non-applicability of "If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation" is not described.		
iv. If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.			Also, following requires clarification: 4. PDD mentions, "Lighting consumes about 20% of electricity" this is supported by footnote no. 4 and "India has very low usage of CFLs with a penetration factor of 4% of ILs" is supported by footnote no.5. However; Authenticity of the article/web page is not demonstrated.). Project		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			participant needs to provide justification on use of this data to support the description of SSC-POA-DD.		
<p>a. In CDM/POA-SSC-PDD section A.4.4 have an acceptable and credible description of the operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA, been provided in Section A.4.4.1 which includes:</p> <p>i. A record keeping system for each CPA under the PoA;</p> <p>ii. A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA;</p> <p>iii. The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.</p> <p>iv. The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;</p>			<p>1. No, the record keeping of each CPA to be included in PoA is not in place. Collection, storage and standard practice / procedure for disposal of Incandescent Lamp is also not defined.</p> <p>2. The system / procedure described to avoid double accounting is defined in section A.4.4.1. (ii) of PDD-PoA.</p> <p>3. This has been described in SSC-POA-DD.</p> <p>4. The PP has decided to spread the awareness for the use of CFL over the conventional IL within the region, through third party agency. However, structure / qualification of personels of third party agency is not clearly mentioned.</p> <p>Also clarify for following :The PDD states “ the project proponent will identify an area within India</p>	CL-10	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			for distribution of CFLs that is manufactured in its facility at Nandikandi village, Andhra Pradesh or any other facility. Where is this other facility ?		
b. In CDM/POA-SSC-PDD in Section A.4.4.2 are following provided?					
i. Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA.			<p>Yes, the Project Participant has proposed to use the sampling method. There are two different methods used for deciding no. of samples for metered and non-metered CFL category.</p> <p>To decide the samples for 'metered CFLs' 90% confidence level with 10% error level is used. Whereas, to decided for no. of samples in 'non-metered' category, 80% confidence level with 20% error level is used. However, there is no justification provided, why there is a change in sampling criteria for metered and nonmetered category.</p> <p>Also, it is not clearly mentioned in PDD, whether PP has followed EB guidelines for sampling and surveys for small-scale CDM project activities.</p>	CAR-4	OK
ii. In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to			Refer (3.j.i) above		



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be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA;					
c. In CDM/POA-SSC-PDD Section A.4.5 has information on public funding been provided?			Yes, it is mentioned that program does not involve any public funding.	OK	OK
d. In CDM/POA-SSC-PDD section B.1 has the Starting date of the POA been provided?			Yes, starting date of PoA is written as 16/04/2008. However, provide the copy of all the contracts / PO / Work Orders signed for this project.	CL-11	OK
e. In CDM/POA-SSC-PDD section B.2 has the Length of the programme of activities (PoA) been provided?			The length of the POA has not been provided in years only and not in months.	CL-12	OK
f. In CDM/POA-SSC-PDD section C1; i. Is it indicated at what level environmental analysis is conducted ?. Is it at POA level or SSC CPA level?			Yes, the environmental analysis is conducted at the PoA level.	OK	OK
ii. Has the choice of level at which the environmental analysis is undertaken been justified ?			The justification for the choice of level at which the environmental analysis is undertaken is not provided.	CAR-5	OK
g. In CDM/POA-SSC-PDD section C.2, does documentation on the analysis of the environmental impacts, including transboundary impacts exist and are they credible/acceptable ?			Under Section C.2 of the POA DD, there is a description that BGPL has submitted Hazard Analysis and Risk Assessment, there is no mandatory requirement, however since BGPL is following RoHS, hence has carried out the analysis and submitted the report. The reference to any mandatory requirement is not indicated in	CL-13	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the PDD. Provide the copy of evidences of Hazard Analysis Risk Assessment study conducted as mentioned in PDD.		
h. In CDM/POA-SSC-PDD section C.3, whether in accordance with the host Party laws/regulations, is an environmental impact assessment required for a typical CPA, included in the programme of activities (PoA) and has been stated/explained?			An environmental impact assessment is not required for a typical CPA. The same is mentioned in PDD.	OK	OK
i. In CDM/POA-SSC-PDD section D.1: i. Has the level at which local stakeholder comments are invited been described?			Yes, the local stakeholder consultation is done at the SSC-POA level.	OK	OK
ii. If yes, is the choice justified ? (Note: If local stakeholder comments are invited at the PoA level, include information on how comments by local stakeholders were invited, a summary of the comments received and how due account was taken of any comments received, as applicable.)			Yes, the justification of the choice of conducting the local stakeholder process at the POA level is provided. The stake holder meeting was carried out 07-March-2009, the validation team has during its site visit, interviewed some of the local stakeholders who were part of the local stakeholder consultation process.	OK	OK
j. In CDM/POA-SSC-PDD section D.2,D.3 & D.4: i. Were local stakeholders (public, including individuals, groups or communities affected, of			The local stakeholder consultation process is conducted at the SSC CPA level. This was done on 07/03/2009. The PDD was webhosted on	OK	OK



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likely to be affected, by the proposed CDM/POA project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM/POA project activity prior to the publication of the PDD on the UNFCCC website?			10/04/2010 to 09/05/2010. There was no negative comment, which is described in PDD.		
ii. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM/POA project activity been invited?			Yes, during the local stake holder meeting, there are no negative comments. This was ensured by validation team during site visit.	OK	OK
iii. Is the summary of the comments received as provided in the PDD complete?			Refer (3.r.i) and (3.r.ii) above	OK	OK
iv. Have the project participants taken due account of any comments received and described this process in the PDD?			Refer (3.r.i) and (3.r.ii) above	OK	OK
k. In Section E.1, is the title and reference of the approved SSC baseline and monitoring methodology described ?			The title and reference of methodology are not indicated in accordance with UNFCCC.	CAR-6	OK
i. Is the version of the applied methodology, the latest ?			Refer to (3.a) above.	-	-
ii. Are the title and the version status of the other tools / methodologies used in the PDD described ?			Yes, AMS I D Version 15 is referred. (in section E.6.1)	OK	OK
l. In Section E.2 of the PDD, is the justification for the choice of the methodology and why it is applicable to the SSC-CPA explained ?			The justification for the choice of the methodology applied to the Project Activity is described in section E.2 of the PDD. The		



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			methodology is applicable for electricity savings of upto 60 Gwh, which is described in the PDD. Also, the same has been described in CDM-Specific DD in section B.2, which clarifies there will be 0.022 Gwh saving ,which is within limit of 60 Gwh. However, clarification for the energy saving value 0.022 Gwh, as mentioned in section A.4.6 of specific CPA PDD is based on replacement of 60w IL bulb and not on replacement of maximum wattage bulb i.e. 100w.	CL-14	OK
m. In CDM/POA-SSC-PDD section E.3 has the sources and gases in the SSC – CPA been provided ?			In the section E.3 of the CDM-PoA-SSC-PDD has described the sources and gases in the SSC-CPA. However, during site visit, it was observed that PP is using Propane gas in the furnace. Emission of CH ₄ by consuming propane is not included CDM-SSC-PoA PDD. Also, it was observed that at the manufacturing plant of CFL, the PP uses DG set of 600 KVA. Emission from this DG set is not described in PDD.	CAR-7	OK
n. In CDM/POA-SSC-PDD section E.4 are following provided?					
i. The baseline for the proposed project activity with reference to the chosen project category.			Yes, the baseline has been indicated in section E.4 of PDD.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Justification of key assumptions and rationales.			Justification of key assumptions and rationales for baseline identification are not provided in POA-DD.	CAR-8	OK
iii. Transparent illustration of all data used to determine the baseline emissions (variables, parameters, data sources etc)			Transparent illustration of all data used to determine the baseline emissions is not provided in the spread sheet "Gollaguda CPA CER" provided by PP..	CAR-9	OK
o. In CDM/POA-SSC-PDD section E.5 are following provided?					
i. Under Section E.5.1, is it assessed and demonstrated that the typical SSC-CPA is additional as per the procedure described in the applied methodology ?			The additionality for the project activity is assessed and demonstrated in Section E.5.1 using combined tool to identify baseline scenario and demonstrate additionality, Version 2.2.	OK	OK
ii. Under Section E.5.2, are the key criteria and data for assessing additionality of an SSC-CPA provided ?			The criteria for assessing additionality of an SSC-CPA is indicated to be based on the common practice barrier analysis for the use of CFL. This will be checked by the penetratin of CFL in each CPA, which will be decided based on survey carried out in each CPA.	OK	OK
iii. Under Section E.5.2, is it demonstrated as to how these criteria would be applied to assess the additionality of a typical CPA at the time of inclusion ?			Refer to (3.w.ii) above	-	-
iv. National policies and circumstances relevant to the baseline of the proposed project activity			Description of national policies and circumstances relevant to the baseline of the proposed Project Activity is not stated in the PDD.	CL-15	OK



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v. Evidence that the incentive from the CDM/POA was seriously considered in the decision to proceed with the project activity, if the starting date of the project activity is before the date of validation.			All evidences for prior consideration of CDM have been submitted to validation team and same have been verified by validation team.	OK	OK
p. In CDM/POA-SSC-PDD section E.6 are following provided?					
i. In Section E.6.1, is the explanation of the methodological choices selected for the typical SSC-CPA provided ?			Description of methodological choice is not provided in accordance with requirement of CDM.	CL-16	OK
ii. In Section E.6.2, are the equations to be used in the calculations of the emission reductions described ?			<p>Yes, the algorithms to calculate the baseline emissions, emission reductions, project emissions and leakage are provided.</p> <p>However, following points needs clarification :</p> <ol style="list-style-type: none"> 1. why value of $ly = 0.1$ (average annual technical grid loss) is used is not clearly explained. 2. The baseline and project emission calculation approach does not include details of emissions on account of CFL manufacturing activity irrespective of location of manufacturing. 3. Also, latest version of CEA database is not referred. 4. Description for standard practice of storage and disposal of ILs to avoid leakage is not 	CL-17	OK



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iii. In Section E.6.3, are the details provided in the tabular format ?			clearly described in PoA-PDD. Refer to (3.x.ii) above and Clarification is required for following points in section E.6.3: 1. Data unit not mentioned in 1 st , 2 nd and 5 th parameter. 2. Source of data is mentioned as Distribution data. Please clarify exactly what kind of source it is. 3. CEA database version 5 is applied. In earlier section it is indicated as version 4. Please clarify.	CL-18	OK
iv. Are all the fields included in the table ?			Refer to (3.x.iii) above	-	-
v. The actual value applied.			These values are provided for some of the parameters as may be applicable and the rest will be taken in each specific CPA that may be added to this POA-DD.	OK	OK
vi. Clear and transparent references or additional documentation provided in annexes.			Detailed calculation of combined margin emission factor has been produced in Annex-3 of POA-DD.	OK	OK
vii. Where values have been measured, a description of the measurement methods and procedures (e.g. which standards have been used), indicated the responsible person/entity having undertaken the measurement, the date of measurement(s) and the measurement			The project participant has carried out a baseline survey for the specific CPA viz. Gollaguda in Dec-2008 and Jan-2009. During site visit by validation team at the Gollaguda hemlet, specific CPA, it was observed that data for IL bulbs, CFLs is different than the	CAR-10	OK



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results			baseline survey. Also, the base line survey carried out by PP does not indicate unique identification no. for the residences/electricity meter no. as mentioned in Specific PDD.		
viii. Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and what is the measurement interval; (i) A description of the QA/QC procedures (if any) that should be applied; (ii) Where relevant: any further comment. Provide any relevant further background documentation in Annex 4.			Refer to (3.j.i) and (3.x.vii) above. For validation purpose, validation team has surveyed 25% samples of the total population of ILs at hemlet Gollaguda for all categories viz. residential, commercial.	-	-
q. Is detailed description of the monitoring plan in Section E 7.1 & E.7.2 provided ?			Following discrepancies were observed in section E.7.1 and E.7.2 1. Description of measurement method is not provided in line with form and requirement. 2. Clarify the QA/QC procedures to be applied. 3. Value of data not mentioned in any of the	CAR-11	OK



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			<p>parameter.</p> <p>4. Description of roles and responsibilities is not complete and adequate.</p> <p>5. If manufacturing is part of project activity then monitoring does not include activity that may be required to be monitored for manufacturing.</p> <p>6. It is mentioned in PDD section A.4.2.1 that manufacturing can be at other facility apart from Nandikandi village. Project emission at 'other' manufacturing site is not included in PDD.</p> <p>7. Accuracy, range, specification of run time meter is not specified.</p> <p>8. The compatibility of 'run time meters' with BGPL make CFL is not clearly mentioned to avoid use of other type of CFLs by users in case of damage/nonworking of BGPL bulb.</p> <p>9. PDD does not describe all the parameters to be collected/recorded during the distribution of CFLS in point 1 of section. E.7.2.</p> <p>10. During site visit by validation team, it was informed that 'run time meters' are devoted to individual/specific CPA. The same is not described in PDD.</p> <p>11. The PDD mentions in section E.7.2 point no. 3 that 'run time meters' will be shifted to</p>		



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			another place after ninety days to take account of the seasonal variations. How ninety days can be used for seasonal variation is not justified in PDD.		
i. Relevant further background information in Annex 4 provided?			No, the Annex-4 refers to the relevant sections of monitoring i.e. E.7.1 and E.7.2 of POA-DD.	OK	OK
r. In CDM/POA-SSC-PDD section E.8 are following provided					
i. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY			Date of completion of application of methodology is 25/01/2010 whereas date of PDD is 10/12/2008. Please clarify.	CL-19	OK
ii. Contact information of the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity			Yes, provided in Annex 1	OK	OK
iii. Indicated if the person/entity is also a project participant listed in Annex 1			Yes, it is provided in Annex 1	OK	OK
s. Is the contact information of the Project Participant provided in Annex 1 ?			Yes	OK	OK
t. Is relevant information in Annex 2 filled in ?			Yes. Information that no public funding available is mentioned.	OK	OK
u. Is any information provided in Annex 3 ?			Yes, combined margin emission factor calculations are provided in Annex-3.	OK	OK
v. Is relevant information provided in Annex 4 of the POA DD ?			NO, Annex 4 does not provide any monitoring information.	OK	OK
4. Project design document – Specific DD					



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a. In Section A.1, is the title of the Project Activity alongwith the version number and the date (in DD/MM/YYYY format) indicated ?			Yes, the title of the project activity alongwith the version number and the date is indicated.	OK	OK
b. In Section A.2, is the description of the small scale CPA included ?			<p>Yes, however the pre-project scenario is not described transparently in section A.2 of specific PDD. E.g. following points are not clearly described in PDD.</p> <p>1) It is stated that for a given lumen output, CFLs consume up to one-fourth (approx.) of power of an equivalent ILs causing reduction in requirement of electricity from the connected electricity grid, which predominantly uses fossil fuel for electricity generation. However, reduction in energy consumption is not demonstrated transparently.</p> <p>2) PDD mentions – “BGPL will carry out series of activities leading to distribution of CFLs in selected areas in India”. The areas planned for distribution by project participant are not clearly mentioned in PDD.</p> <p>3) It is mentioned in economic well being that the distributed CFL would consume less power compared to the IL, thus reducing the electricity bills of consumers covered under the project activity. Clarify how this will not</p>	CL-20	OK



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			attract the users to use other electrical appliances? Provide evidence for reduction in electricity bill of consumers. 4) The table in section A-2 show no. of lighting devices and total penetration rate of 9% CFL does not match. Provide complete details to demonstrate that there is a penetration level of energy efficient CFL as 9%.		
c. In Section A.3, is the entity /individual responsible for the small scale CPA described ?			In Section A.3, it is indicated that Balaji Greentech Products Limited is the only project participant for Gollaguda i.e. specific CPA.	OK	OK
d. In Section A.4.1.2, is the geographic reference or other means of identification of the SSC CPA indicated ?			a. The geographic reference for the CPA i.e. Gollaguda are provided in Section A.4.1.2. However, map of India is not clearly visible, also, format for Longitude and latitude for India, which covers CPA is different than PoA-DD. b. Clear relation of Gollaguda hamlet, Medak district, Sadaseovpet not clearly described. c. The names and contact details of the entity / individual responsible for the CPA is not indicated, as required by the completeness guidelines for CPA form.	CAR-12	OK
e. Is the above information restricted to one page ?			Yes, the details are provided effectively in one page.	OK	OK
f. In CPA-PDD, section A.4.2 are the following					



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provided?					
i. The starting date of a small-scale CPA project activity is the earliest of the date(s) on which the implementation or construction or real action of a project activity begins/has begun (EB33, Para 76/CDM/POA Glossary of terms/EB41, Para 67)			The starting date of CDM/PoA project activity is mentioned in PoA DD is 16/04/2008, start date of specific CPA is from July 2010, which is related with distribution activity of CFL. However, it is not described and related with real action of a project activity that has begun. (EB33, Para 76/CDM/POA Glossary of terms/EB41, Para 67)	CL-21	OK
ii. A description of how this start date has been determined, and a description of the evidence available to support this start date			Refer to (4.f.i) above	-	-
g. In small-scale CPA DD, section A.4.2.2 is the expected operational lifetime of the project activity in years and months provided?			The operational lifetime of CDM – PoA is 28 years and specific CPA is 10 years as mentioned. This is not mentioned in line with requirement of PDD.	CL-22	OK
h. In small-scale CPA DD section A 4.3 is it stated whether the project activity will use a renewable or a fixed crediting period and completed C.2.1 or C.2.2 accordingly ?			Yes, the project activity will use fixed crediting period.	OK	OK
i. In small-scale CPA DD section A.4.3 are the dates in the following format: (DD/MM/YYYY) provided?	C.2. 11		The date in Section A.4.3 of Specific DD is not described in the required format.	CL-23	OK
j. In Section A.4.3.1, is the starting date of the crediting period indicated ?			Yes, the date mentioned is 01/07/2010.	OK	OK
k. In Section A.4.3.2, is the length of the crediting period indicated in DD/MM/YYYY format ? Further is it ensured that the duration of the			Yes, the length of the crediting period is mentioned as 10 years 0 months.	OK	OK



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crediting period of any CPA does not exceed the end date of the POA ?			Further, it is ensured that the crediting period (10 years) of the CPA does not exceed the end date of the POA. (28 years)		
l. Is information on the estimated amount of emission reductions over the crediting chosen period is provided in accordance with the CDM-SSC-CPA-DD form, Version 1 in tabular format ?			Yes, The information on estimated amount of emission reductions over chosen crediting period is provided correctly in tabular format. However, the calculation of emission reduction is not correct, as it does not consider the emissions due to manufacturing of CFLs, including grid electricity consumption, propane, consumption and diesel used in DG set in case of exigency.	CAR-13	OK
m. Is it clearly indicated that the proposed CPA involves any public funding ?			Yes, it is mentioned that CPA does not involve any funding.	OK	OK
n. Is information provided in Section A.4.6 to confirm that the SSC CPA of a POA is not a de-bundled component ?			The information is provided on the de-bundling aspect. However, while demonstrating that specific CPA satisfies the condition of 1% of the small-scale threshold of 60 Gwh/annum, CFL bulb wattage considered for calculation is not for maximum wattage of CFL, which is to be used in the project activity. Please clarify.	CL-24	OK
o. In Section A.4.7, is a confirmation provided that the SSC CPA is neither registered as an individual CDM Project Activity or part of another registered POA ?			Yes	OK	OK
p. In Section B.1, is the title and reference of the registered POA to which the SSC CPA is added,			Yes, the title of POA to which the SSC CPA is added is provided in specific CPA-DD.	OK	OK



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provided ?					
q. In Section B.2, is justification provided on why the SSC CPA is eligible to be included in the registered POA ?			Yes, justification is provided on why the SSC CPA is eligible to be included in the registered POA. However, in eligible criteria no. 3, it is not explained clearly how specific CPA will meet BIS and IEC standards as required by the criteria.	CL-25	OK
r. In Section B.3, is the assessment and demonstration of additionality provided in accordance with eligibility criteria listed in POA ?			Yes.	OK	OK
s. In Section B.4, is the description of the sources and gases detailed ? Further is it proven that the SSC CPA is located within the geographical boundary of the registered POA?			Yes, there is a description of the sources and gases detailed in section B.4 of the specific PDD. However, it is not demonstrated that the SSC CPA is located within the geographical boundary of the registered POA.	CAR-14	OK
t. In Section B.5.1, are the data and parameters that are available at validation provided in accordance with CDM-SSC-CPA-DD form, Version 1 ?			Yes	OK	OK
u. In Section B.5.2, is a transparent ex-ante calculation of all the parameters of baseline emissions, project emissions and leakage provided ?			However, Justify rational for using value of $I_y = 0.1$ in the ex-ante calculation of all the parameters of baseline emissions, project emissions and leakage provided. Refer to (3.x.ii) above.	-	-
v. In Section B.5.3, is the information on ex-ante estimation of emission reductions provided in the tabular format ?			The POA is manufacture and distribution of CFL in India, it is not clearly mentioned why manufacturing activity emissions are neglected/not considered as project emissions.	CL-26	OK



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w. In Section B.6.1, is the description of the monitoring plan provided ?			The monitoring plan is described in section B.6.1 of CPA-DD. However, it is required to address, the CAR-8 in (3.y) above in view of overall monitoring.	-	-
x. In Section C.1, is the level at which environmental analysis is carried out described ?			Yes, the level at which environmental analysis is carried out is described at the POA level. Refer to (3.n.ii) above	-	-
y. Are further informations/documentation on the analysis of environment impacts including transboundary impacts and requirement of environment impact assessment for a typical CPA included in POA, in accordance with host party laws/regulations provided in section C.2 and C.3 respectively, if applicable ?			Refer to (3.o) above	-	-
z. In Section D.1, is the level at which local stakeholder consultation process conducted indicated ? Is the choice justified ?			Yes, local stakeholder consultation process is at the PoA level. However, the choice is not justified. The PoA level stakeholder meeting is conducted on 07/03/2009. However in the CPA DD is not transparent whether sufficient time was provided to the local stakeholder to provide their comments.	CAR-15	OK
aa. Is information on how comments by local stakeholders have been invited and complied and summary of those comments provided in section D.2 and D.3 respectively, if applicable ?			Yes, it is mentioned that the local stakeholders were invited through formal invitation as well as personal invitations to participate in local stakeholder consultation process.	OK	OK
bb. Is the contact information of the Project			Yes	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Participant provided in Annex 1 ?					
cc. Is relevant information in Annex 2 filled in ?			Yes	OK	OK
dd. Is any information provided in Annex 3 ?			Yes	OK	OK
ee. Is relevant information provided in Annex 4 of the CDM-SSC-CPA-DD ?			No	OK	OK
5. Project description					
In the POA DD, the generic and specific CPA DD;	VVM	58	The description of the pre-project and the project activity is not transparently described in the POA DD. Ex. For a given lumen output, CFLs consume up to one-fourth (approx.) of power of an equivalent ILs causing reduction in requirement of electricity from the connected electricity grid, which predominantly uses fossil fuel for electricity generation. Supporting evidence is not provided for the same.	CAR-16	OK
a. Does the PDDs contain a clear description and scope of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?			<ol style="list-style-type: none"> 1. In Specific CPA DD - Quantity does not match in the table, what are other lighting devices than CFL, IL is not clarified. 2. It is mentioned that 'Run meters will be installed in the holders of the project CFLs to capture the usage of CFLs' – How does PP ensure that meters starts from 'zero', what are the checks of run meter and configuration of run meter are not clarified. 3. Also, during the validation team's visit, it was informed that run time meters will be devoted to particular CPA, which is not transparently 		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			described in Specific/PoA PDD.		
b. Does the description and scope of the proposed CDM/POA project activity as contained in the PDD:	VVM	59			
i. sufficiently covering all relevant elements?	VVM	59	Refer to (5.a) above	-	-
ii. accurate?	VVM	59	Refer to (5.a) above	-	-
iii. providing the reader with a clear understanding of the nature of the proposed CDM/POA project activity?	VVM	59	No, the pre-project and the project activity description are not mentioned in clear understanding nature. Refer to (5.a) above.	-	-
c. Is the proposed CDM/POA project activity in existing facilities or utilizing existing equipments?	VVM	60	No, the proposed CDM/POA project activity is not utilizing existing facilities/equipments. It is a Greenfield project of manufacturing CFLs and distribution of them.	OK	OK
d. Is the CDM/POA project activity one of the following types:	VVM	60			
i. Large scale?	VVM	60	No	OK	OK
ii. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year?	VVM	60	The project activity complies with the small-scale criteria of POA i.e. aggregate energy savings in single CPA will be limited to 60 GWh per annum.	OK	OK
iii. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes ?	VVM	60	No	OK	OK
e. If yes to (c) and (d) above, was a physical site inspection conducted to confirm that the description in the CPA/PDDs reflects the proposed CDM/POA project activity, unless other means are specified in the methodology?	VVM	60	Yes, the validation team has physical site inspection conducted during 24-26 May 2010 at manufacturing plant at Nandikandi village and at specific CPA i.e. Gollaguda village.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
f. If yes to (d.iii) above, was the number of physical site visits base on samping?	VVM	60	Not Applicable	OK	OK
g. If yes is the sampling size appropriately justified through statistical analysis ?	VVM	60	Not Applicable	OK	OK
h. For all other proposed CDM/POA project activities not referred to in paragraphs 59 – 60, and for other individual proposed small scale CDM/POA project activities with emission reductions not exceeding 15,000 tonnes per year, was a physical site inspection conducted?	VVM	62	Refer above comments. At present only one CPA is included in the project.	-	-
i. If no:	VVM	62			
i. Was the validation undertaken by reviewing available designs and feasibility studies, conducting comparison analysis to equivalent projects, as appropriate?	VVM	62	Not Applicable	OK	OK
ii. Was it appropriately justified?	VVM	62	Not Applicable	OK	OK
j. Does the proposed CDM/POA project activity involve the alteration of an existing installation or process ?	VVM	63	No, the proposed POA does not involve alteration of an existing installation or process at “manufacturing plant” but at distribution of CFL, installed Incandensate bulbs are existing and are to be replaced with new CFLs.	OK	OK
k. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation ?	VVM	63	The project description in the PDD does not state the essential differences resulting in the project activity scenario vis-à-vis the pre-project situation.	CL-27	OK
l. A description of how environmentally safe and sound technology and know how is being			The PDD does not describe in details how and why reduction in use of fossil fuel is there due to	CL-28	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied by the project activity interalia technology transfer to the Host Party(ies) for application in the project activity			project activity and how environmentally safe and sound technology and know how is being applied.		
m. Has a description of criteria for enrolling the CPA been described (the criteria for demonstrating additionality of CPA should be described in section E.5)			Additionality of enrolling CPA is described in E.5 of POA by penetration level. In specific CPA Additionality is demonstrated in section B.5. This is done by common practice barrier and by investment analysis.	OK	OK
6. Baseline and monitoring methodology					
a. General requirement					
a. Do the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM/POA Executive Board ?	VVM	65	Yes, the proposed Project Activity has selected the approved small-scale methodology AMS II C, Version 13, which has been previously approved by the CDM EB.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<p>b. Is the selected methodology applicable to the project activity ?</p> <p>1. This category comprises technologies or measures which reduce technical energy losses through improving the energy efficiency of either (a) An electricity transmission/distribution system resulting in electricity savings of up to 60 GWh per year, or (b) A thermal energy (e.g., steam or hot water) distribution system resulting in fossil fuel savings of up to 180 GWh per year.</p> <p>2. This category does not include:</p> <p>(i) Measures that reduce technical losses solely by improving operations and/or maintenance practices. For example low-voltage conditions in the network, uneven distribution of loads, loose connections, etc.</p> <p>(ii) The introduction of capacitor banks and tap changing transformers for reducing losses in an electricity distribution; this is because technical loss reductions due to such measure can not be determined using the simplified approaches defined in this methodology.</p>	VVM	66	<p>Yes, The proposed project activity comprises of "Manufacture and Distribution of CFLs in India".</p> <p>The electricity savings arising out of the proposed project activity for specifica CPA i.e. Golladuada hamlet is 16 tonnes CO2e per year. This is less than 60 GWh per year. This is also confirmed by CER calculation sheet provided by PP.</p>	OK	OK
c. Had the selected methodology been correctly applied with respect to project boundary ?	VVM	67	No, the project boundary is not correctly applied with respect to selected methodology. Refer to (3.u) and (3.x.ii) above	-	-
d. Had the selected methodology been correctly	VVM	67	Yes, the baseline identification is selected by	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied with respect to baseline identification?			correctly applying selected methodology.		
e. Had the selected methodology been correctly applied with respect to Algorithms and/or formulae used to determine emission reductions?	VVM	67	Yes, however, use of algorithm and formulae is not justified. Refer to (3.x.i) and (3.x.ii) above.	-	-
f. Had the selected methodology been correctly applied with respect to additionality?	VVM	67	Yes, the additionality has been demonstrated by using combined tool for baseline identification and assessment and demonstration of additionality.	OK	OK
g. Had the selected methodology been correctly applied with respect to monitoring methodology?	VVM	h.	No, the selected methodology is not correctly applied with respect to monitoring methodology. Justification for different sampling criteria is not provided. Ex. The samples to be used are different for 'metered CFLs' with 90% confidence level and 10% error and for non metered samples with 80% confidence level and 20% error. Refer to (3.j.i) above	-	-
b. Applicability of the selected methodology to the project activity					
a. Is the selected baseline and monitoring methodology, previously approved by the CDM/POA Executive Board, applicable to the	VVM	68	Yes, the applicability all three applicability conditions are complied by the project activity and hence are applicable. Refer to (6.a.b) above.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
project activity ?					
b. Is the methodology correctly quoted?	VVM	69	Yes. AMS II C, Version 13.	OK	OK
c. Are the applicability conditions of the methodology met?	VVM	70	Yes, refer to (6.a.b) above.	OK	OK
d. Is the proeject activity expected to result in emissions other than those allowed by the methodology ?	VVM	70	No	OK	OK
e. Is the choice of the methodology justified ?	VVM	70	Yes	OK	OK
f. Have the project participants shown that the project activity meets each of the applicability conditions or the approved methodology?	VVM	70	Yes. Each of the applicability conditions are met by project activity and the same has been produced applicability condition wise in a tabular format.	OK	OK
g. Have the project participants shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology ?	VVM	70	Yes, the project participant has shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology. However, Description of standard practice of storage and disposal of replaced ILs is not clearly described in PoA DD. Refer to (3.x.i) and (3.x.ii) above.	-	-
h. Is the DOE, based on local and sectoral knowledge, aware that comparable information is available from sources other than that used in the PDD?	VVM	70	Not Applicable	OK	OK
i. If yes, was the PDD cross checked against the other sources to confirm that the project activity meets the applicability conditions of the	VVM	70	Not Applicable	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
methodology? (provide the reference to these choices)					
j. Can a determination regarding the applicability of the selected methodology to the proposed CDM/POA project activity be made?	VVM	71	Yes, refer to (6.b.f) and (6.b.g) above,	OK	OK
k. If no, clarification of the methodology was requested, in accordance with the guidance provided by the CDM/POA Executive Board?	VVM	71	Not Applicable	OK	OK
l. If answer to (5.b.c) above is "no", revision or deviation from the methodology was requested, in accordance with the guidance provided by the CDM/POA Executive Board?	VVM	72	Not Applicable	OK	OK
m. If yes to (5.b.k) and (5.b.l) above, a request for registration was submitted before the CDM/POA Executive Board has approved the proposed deviation or revision?	VVM	73	Not Applicable	OK	OK
c. Project boundary					
a. Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM/POA project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM/POA project activity ?	VVM	77	No. The PDD does not correctly describe the project boundary, including the physical delineation of the proposed CDM/POA project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM/POA project activity. The project activity is "Manufacture and Distribution of CFLs in India", which includes	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			consumption of electricity by manufacturing plant, propane in project boundary, the same is not transparently described in PDD. Refer to (3.u) and (3.x.ii) above.		
b. Is the delineation in the PDD of the project boundary correct ?	VVM	78	Refer to (6.c.a) above	-	-
c. Does the delineation in the PDD of the project boundary meet the requirements of the selected baseline ?	VVM	78	Refer to (6.c.a) above	-	-
d. Have all sources and GHGs required by the methodology been included within the project boundary ?	VVM	78	Refer to (6.c.a) above	-	-
e. Does the methodology allow project participant to choose whether a source or gas is to be included within the project boundary?	VVM	78	Refer to (6.c.a) above	-	-
f. If yes, have the project participants justified that choice?	VVM	78	Refer to (6.c.a) above	-	-
g. If yes, is the justification provided reasonable? (provide reference to the supporting documented evidence provided by the project participants)	VVM	78	Refer to (6.c.a) above	-	-
d. Baseline identification					
a. Does the PDD identify the baseline for the proposed CDM/POA project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed	VVM	80	Yes. The project activity uses "combined tool to identify the baseline scenario and demonstrate additionality" in section E.4. Following points are not clearly described in PDD.	CAR-17	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
CDM/POA project activity ?			<ol style="list-style-type: none"> 1. In substep-2 (a) Barrier analysis: as per PDD statement "Market study done by BGPL indicates that the market size of CFLs in India is 125 billion compared to 900 million market for ILs. This is not substantiated with supportive. 2. Out come of step-2 includes the identification of most plausible baseline scenario, but the same has not be explicitly explained how that is the most plausible scenario Project Participant could have opted for in absence of project activity. 3. In Step 3 : IRR comparison for production and distribution of IL and CFL is not provided for similar no. of production capacity, with same investment. 4. It was observed and discussed during site visit that the replacement of IL bulb will take place on sampling survey basis. However, it is not clear with respect to baseline identification that how Project Participant will ensure/decide the remaining lifetime of IL being replaced with CFL. Also, mechanism to ensure baseline equivalent to complete lifetime of CFL is not explicitly described in baseline identification. 		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	81	Refer to (6.d.a) above. The project activity uses "combined tool to identify the baseline scenario and demonstrate additionality" in section E.4.	OK	OK
c. Does the selected methodology require use of tools (such as the "Tool for the demonstration and assessment of additionality" and the "Combined tool to identify the baseline scenario and demonstrate additionality") to establish the baseline scenario ?	VVM	81	Project activity uses combined tool to identify baseline and demonstrate additionality. Refer to (6.d.b) above.	-	-
d. If yes, was the methodology consulted on the application of these tools? (In such cases, the guidance in the methodology shall supersede the tool.)	VVM	81	Applied methodology refers to the general guidance of SSC methodology. Under this general guidance the project activity uses combined tool as mentioned above in (6.d.b).	OK	OK
e. Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario ?	VVM	82	Yes	OK	OK
f. If yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the context of the proposed CDM/POA project activity ?	VVM	82	Yes	OK	OK
g. Has any reasonable alternative scenario been excluded ?	VVM	82	No	OK	OK
h. Is the baseline scenario identified reasonably supported by:	VVM	83			
i. Assumptions?	VVM	83	Yes	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Calculations?	VVM	83	Yes	OK	OK
iii. Rationales?	VVM	83	No, the rationale for $ly = 0.1$ is not justified, as given in baseline scenarion. Refer to (3.x.ii) above.	-	-
i. Are the documents and sources referred to in the PDD correctly quoted and interpreted?	VVM	83	Yes	OK	OK
j. Was the information provided in the PDD cross checked with other verifiable and credible sources, such as local expert opinion, if available? (idendify the sources)	VVM	83	Not Applicable	OK	OK
k. Have all applicable CDM/POA requirements been taken into account in the identification of the baseline scenario for the proposed CDM/POA project activity ?	VVM	84	Refer to (6.d.h.iii) above.	-	-
l. Have all relevatn policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM/POA Executive Board?	VVM	84	All relevant national policies and guidelines appropriate to the Project Activity have not been discussed clearly in the PDD. Clarify them further.	CL-29	OK
m. Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM/POA project activity ?	VVM	85	Yes	OK	OK
<i>e. Algorithms and/or formulae used to determine emission reductions</i>					
a. Do the steps taken and equations applied to	VVM	88	Yes, however value of $ly = 0.1$ is not	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring?			transparently described as required by the methodology . Refer to (3.x.ii) above.		
b. Have the equations and parameters in the PDD been correctly applied with respect those in the selected approved methodology ?	VVM	89	Yes, The equations provided in section E.6.1 of POA-DD and section B.5.2 of specific CPA-DD are in accordance with selected methodology.	OK	OK
c. Does the methodology provide for selection between different options for equations or parameters?	VVM	89	No	OK	OK
d. If yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM/POA project activity and other evidence provided)?	VVM	89	Not Applicable	OK	OK
e. If yes, have correct equations and parameters been used, in accordance with the methodology selected?	VVM	89	Not Applicable	OK	OK
f. Will data and parameters be monitored throughout the crediting period of the proposed CDM/POA project activity?	VVM	90	Yes, there are certain data parameters which are available at the time of validation and which are indicated in Section E.6.3 of the specific PDD. Further there are other data parameters that are monitored and reported during the monitoring / verification period and reported in Section B.7.1	OK	OK
g. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions:	VVM	90	Not Applicable	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Appropriate and correct?	VVM	90	Not Applicable	OK	OK
ii. Applicable to the proposed CDM/POA project activity?	VVM	90	Not Applicable	OK	OK
iii. Resulting in a conservative estimate of the emission reductions?	VVM	90	Not Applicable	OK	OK
h. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	90	Yes, these parameters are indicated in Section B.7.1 of the PDD.	OK	OK
i. If yes, are the estimates provided in the PDD for these data and parameters reasonable?	VVM	90	The estimates provided in the PDD seem to be reasonable	OK	OK
7. Additionality of a project activity					
a. Does the PDD describe how a proposed CDM/POA project activity is additional?	VVM	93	<p>Yes, Section E.4 of the POA DD describes the additionality based on combined tool to identify the baseline scenario and demonstrate the additionality. Refer to (6.c) below.</p> <p>The common practice barrier analysis is used to demonstrate the additionality of each SSC-CPA in specific CPA.</p> <p>However, following is not justified:</p> <p>PDD mentions, "Lighting consumes about 20% of electricity" this is supported by footnote no. 4, which has website reference. However, Authenticity of the article/webpage is not demonstrated. (Same is for foot note no. 5)</p>	CAR-18	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>(Common practice) Barriers due to prevailing practice :</p> <p>It is not proven that the proposed project activity is one among the first of its kind in the geographical area.</p> <p>It is not justified as to how the CDM revenues would alleviate all the barriers discussed in the POA and CPA DD.</p>		
b. Specific questions per additionality tool and specific complementary or alternative requirements included in the approved CDM/POA methodology.	VVM	94	Refer to (7.a) above	-	-
c. For small scale project activities, specific questions per the specific requirements on demonstration of additionality for small scale project activities in chapter V, section E subsection 7 (Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM/POA project activities) and the "Non-binding best practice examples to demonstrate additionality for SSC project activities (< http://CDM/POA.unfccc.int/EB/035/eb35_repan34.pdf >.)			Refer to (7.a) above	-	-
➤ The coordinating/managing entity shall, within the CDM/POA-SSC-POA-DD, apply			The coordinating/managing entity i.e. BGPL has within the CDM/POA-SSC-POA-DD, applied the	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<p>the additionality provisions to a typical CPA. The outcome of this assessment shall also specify the precise eligibility criteria that each of the CPA should satisfy to be considered additional.</p> <ul style="list-style-type: none"> ➤ For small-scale PoAs it is not expected that the eligibility criteria would require CPA specific retesting of either the decisive barrier which is used to demonstrate additionality or a CPA specific investment analysis. ➤ If each of the independent subsystems/measures (e.g. biogas digester, solar home photovoltaic or thermal system, improved cook stove, CFL etc.) included in the CPA of a PoA is no greater than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing additionality demonstration. If each CPAs of a PoA are exempted from additionality demonstration at CPA level then additionality demonstration will not be a part of eligibility criteria for CPA inclusion in a specific PoA. ➤ If one or more of the sub-system/measure included in a CPA exceeds 1% of the 			<p>additionalityprovisions to a typical CPA.. However, the aggregate energy saving calculation is not transparently described. Refer to (3.t) above</p>		



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small-scale threshold and each CPA of a small scale PoA are within the threshold defined by the methodology applied, coordinating/ managing entity shall establish the eligibility criteria which are sufficiently specific to ensure that the core rationale which demonstrates the additionality for the PoA will be applicable to each CPA proposed for later inclusion.					
a. Prior consideration of the clean development mechanism					
a. Is the project activity start date prior to the date of publication of the PDD for stakeholder comments ?	VVM	96	No, the POA DD was web hosted on the UNFCCC website from 10 April 2010 to 9 May 2010. The start date of the project activity as indicated in Section B.1 of the POA DD is 16 April 2008.	OK	OK
b. If yes, were the CDM/POA benefits considered necessary in the decision to undertake the project as a proposed CDM/POA project activity ?	VVM	96	Yes, the CDM/POA benefits were considered while making decision by the management of Balaji Greentech to undertake project activity. This was minuted in board meeting dated 20 March 2008 and confirmed by the validation team having reviewed the original board meeting minutes register during site visit.	OK	OK
c. Is the start date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM/POA terms", which states that "The starting date of a CDM/POA project activity is	VVM	97	The justification for why the date indicated in Section B.1 of the POA DD is considered as the start date of the project activity is not mentioned.	CL-30	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the earliest date at which either the implementation or construction or real action of a project activity begins.”?					
d. Does the project activity require construction, retrofit or other modifications?	VVM	97	Yes, as the project activity is a Greenfield project it requires to construct manufacturing plant, however, for distribution activity no construction, retrofit or modification is required. It is replacement of IL bulb with new CFLs.	OK	OK
e. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date?	VVM	97	Yes, it is ensured that the date of commissioning (1 August 2009) is not the same as project activity start date (16/04/2008)	OK	OK
f. Is it a new project activity (project activities with starting date on or after 02 August 2008) or an existing project activity (project activities with a start date before 02 August 2008)?	VVM	98	The project activity is not a new project. The start date (16/04/2008) is before 02 August 2008.	OK	OK
g. For a new project, for which PDD has not been published for global stakeholder consultation or a new methodology proposed to the Executive Board before the project activity start date, had the PP informed the Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM/POA status? (Provide reference to such confirmation from Host Party DNA and/or UNFCCC secretariat).	VVM	99	Not Applicable as the project activity is not a new project activity.	OK	OK
h. For an existing project activity, for which the start date is prior to the date of publication of the	VVM	100			



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
PDD for global stakeholder consultation, are the following evidences provided:					
i. evidence that must indicate that awareness of the CDM/POA prior to the project activity start date, and that the benefits of the CDM/POA were a decisive factor in the decision to proceed with the project, including, inter alia:	VVM	100			
a. minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM/POA project activity?			Refer to (7.a.b) above	OK	OK
ii. reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM/POA status for the project in parallel with its implementation, including, inter alia:	VVM	100			
a. contract with consultants for CDM/POA/PDD/methodology services?	VVM	100	The consultant was appointed by project participant in order to avail consulting services for the CDM/POA project activity development on 21 October 2008.	OK	OK
b. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon	VVM	100	Not Applicable, as the project participant has not yet entered in to ERPA.	OK	OK



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funds) ?					
c. evidence of agreements or negotiations with a DOE for validation services?	VVM	100	Yes.	OK	OK
d. submission of a new methodology to the CDM/POA Executive Board?	VVM	100	Not applicable as the project activity uses approved methodology AMS II C, Version 13.	OK	OK
e. publication in newspaper?	VVM	100	Yes, the publication in newspaper is given on 2 March 2009.	OK	OK
f. interviews with DNA?	VVM	100	The project participant has applied for the Host Country Approval on 22 March 2010. Validation team has reviewed a copy of application and confirms the same. Hence, the interview with DNA is awaited by project participant.	OK	OK
g. earlier correspondence on the project with the DNA or the UNFCCC secretariat?	VVM	100	During site visit, the validation team has checked the email communications with UNFCCC and NCDMA for the consideration of CDM for CFL project under POA on 22 October 2008.	OK	OK
b. Identification of alternatives					
a. Does the approved methodology that is selected by the proposed CDM/POA project activity prescribe the baseline scenario and hence no further analysis is required?	VVM	103	No, the baseline scenario is not prescribed by the applied methodology AMSII C, Version 13. The PP has demonstrated the baseline scenario in POA –DD section E.4 with different options..	OK	OK
b. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVM	103	Yes, the PDD identifies credible alternatives to the project activities.	OK	OK
c. Does the list of alternatives given in the PDD ensure that:	VVM	104			



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM/POA project activity?	VVM	104	Yes	OK	OK
ii. the list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM/POA project activity?	VVM	104	Yes	OK	OK
iii. the alternatives comply with all applicable and enforced legislation ?	VVM	104	Yes, the alternatives mentioned are in complianca of all applicable and enforced legislation.	OK	OK
c. Investment analysis					
a. Has investment analysis been used to demonstrate the additionality of the proposed CDM/POA project activity?	VVM	106	The additionality of the project is based on investment analysis and barrier due to prevailing practice.	OK	OK
b. If yes, does the PDD provide evidence that the proposed CDM/POA project activity would not be:	VVM	106			
i. the most economically or financially attractive alternative?	VVM	106	Yes	OK	OK
ii. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?	VVM	106	Yes	OK	OK
c. Was this shown by one of the following approaches?	VVM	107			



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Demonstrate that the proposed CDM/POA project activity would produce no financial or economic benefits other than CDM/POA-related income. Document the costs associated with the proposed CDM/POA project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM/POA project activity.	VVM	107	<p>The PDD section E.4 describes in investemnt analysis that apart from CDM revenue, there will be income of Rs. 15/- for each CFL which is replaced in lieu of IL bulbs. With this income also, it is demonstrated that the project is financially not viable.</p> <p>However, during site visit of the validation team, it was discussed that BGPL has a planning of selling CFL tubes to the retail market in case of surplus production capacity and also to the bulk consumer/customer. Income of this is not considered in financial investment and also not described in the PDD.</p> <p>Also, it was discussed that PP has a planning to purchase CFLs from other manufacturer and distribute the same under PoA. This is not considered investment analysis and also not described in PDD.</p>	CL-31	OK
ii. The proposed CDM/POA project activity is less economically or financially attractive than at least one other credible and realistic alternative.	VVM	107	Refer to (7.c.c.i) above	-	-
iii. The financial returns of the proposed CDM/POA project activity would be insufficient to justify the required	VVM	107	Refer to (7.c.c.i) above	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
investment.					
d. Was a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices conducted?	VVM	109	The financial analysis submitted by the project participant does not includes sources of all the input values for the validation. Also, the project participant has not submitted all the documents related to assumptions made for financial calculations.	CL-32	OK
e. Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices?	VVM	109	Refer to (7.c.d) above	-	-
f. Were feasibility reports, public announcements and annual financial reports related to the proposed CDM/POA project activity and the project participants reviewed?	VVM	109	Yes, the project participant has submitted the "Techno-Economic Viability Study" carried out for State Bank of Hyderabad by B.Naga Bhushan & Co. in February 2008. The same has been reviewed by validation team.	OK	OK
g. Was the correctness of computations carried out and documented by the project participants assessed ?	VVM	109	<p>Following details are observed in investment analysis submitted:</p> <ul style="list-style-type: none"> ➤ It is stated that Investment Comparison Analysis is used to demonstrate the additionality. However, it is not explained why Investment comparison analysis is used. ➤ Clarify the cost of CFLs. Will it be free of cost or chargeable by nominal amount, which is taken as Rs. 15 for IRR calculations. 	CAR-19	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<ul style="list-style-type: none"> ➤ Clarify the financial indicator. It is Project IRR or Equity IRR or NPV as the table shows both IRR and NPV. What about debt for the project implementation? ➤ IRR without CDM is not mentioned in case of project scenario in the table provided. ➤ Clarify the consideration of the term loan and its interest in decision making with required supportive. ➤ The financials are calculated only for 10 years. This is not clarified why they are calculated only for 10 years. ➤ Sources of input values are not mentioned anywhere in entire financials submitted for validation of project activity. 		
h. Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions assessed?	VVM	109	The sensitivity analysis is carried out. However, the production of the CFL is not subjected to sensitivity analysis. Please explain. Also, the spreadsheets submitted to validation team does not includes sensitivity analysis.	CL-33	OK
i. Is the type of benchmark applied is suitable for the type of financial indicator presented ?	VVM	110	Not applicable as the project uses investment comparison analysis and not benchmark analysis.	OK	OK
j. Do any risk premiums applied determining the benchmark reflect the risks associated with the project type or activity?	VVM	110	No, Refer to (7.c.i) above	OK	OK
k. To determine this, was it assessed whether it is				OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
reasonable to assume that no investment would be made at a rate of return lower than the benchmark by:					
i. assessing previous investment decisions by the project participants involved?	VVM	110	No, Refer to (7.c.j) above	OK	OK
ii. determining whether the same benchmark has been applied?	VVM	110	No, Refer to (7.c.j) above	OK	OK
iii. determining if there are verifiable circumstances that have led to a change in the benchmark?	VVM	110	No, Refer to (7.c.j) above	OK	OK
l. Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities?	VVM	111	Yes, the project participant rely on values of Techno-Economic Viability Study Report carried out for Bank of Hyderabad, which is finally approved by State Bank of Hyderabad and sanctioned a loan.	OK	OK
m. If yes:	VVM	111			
i. has the FSR been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed?	VVM	111	Yes, the Techno-Economic Viability Study Report has been the basis of decision. This study report was done by M/s. B. Naga Bhushan & Co. in February 2008 and project participant made a decision based on this report on 20 March 2009.	OK	OK
ii. Are the values used in the PDD and associated annexes fully consistent with	VVM	111	The values used in the PDD are not in accordance with the report mentioned above.	CAR-20	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the FSR?			The IRR value as per the report is 71.38% with CDM revenue. The same is not mentioned in CDM. The complete presentation of the results of investment analysis are not according to the Techno-Economic Viability Study Report. Also, refer to (7.c.g) above.		
iii. If not, was the appropriateness of the values validated?	VVM	111	Refe to (7.c.m.ii) above.	-	-
iv. On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision?	VVM	111	Refer to (7.c.g) and (7.c.m.ii) above	-	-
d. Barrier analysis					
a. Has barrier analysis been used to demonstrated the additionality of the proposed CDM/POA project activity ?	VVM	113	The barrier analysis, as a part of “ <i>Combined tool to identify baseline and demonstrate additionality</i> ”, is used to identify the baseline scenario of project activity. The project activity uses investment analysis and common practice analysis to demonstrate the additionality.	OK	OK
b. If yes, does the PDD demonstrate that the proposed CDM/POA project activity faces barriers that:	VVM	113			
i. prevent the implementation of this type of proposed CDM project activity ?	VVM	113	Yes, the project activity faces financial barrier as described in investment analysis of PDD. Refer to (7.c) above for details.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. do not prevent the implementation of at least one of the alternatives ?	VVM	113	Yes.	OK	OK
c. Are there any issues that have a clear direct impact on the financial returns of the project activity, other than: risk related barriers, for example risk of technical failure, that could have negative effects on the financial performance; or barriers related to the unavailability of sources of finance for the project activity? {If yes, these issues cannot be considered barriers and shall be assessed by investment analysis. [Refer to (6.c) above]	VVM	114	Refer to (7.c) above	-	-
d. Were the barriers determined as real by:	VVM	115			
i. assssing the available evidence and/or undertaking interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist ?	VVM	115	It is not clear as how barriers as described in PDD are real and prohibitive to implementation of project activity. Please explain in detail how CDM revenue will help overcome these barriers identified in barrier analysis of section E.4 of POA-DD.	CL-34	OK
ii. ensuring that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics ?	VVM	115	Refer to (6.d.a) and (7.d.d.i) above	-	-
iii. Is existence of a barrier substantiated only by the opinions of the project participants ? (If yes, this barrier cannot be considered	VVM	115	Refer to (6.d.a) and (7.d.d.i) above	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
as adequately substantiated)					
e. Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible alternatives by applying local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM/POA project activity and would not equally prevent implementation of <i>at least one of</i> the possible alternatives, in particular the identified baseline scenario ?	VVM	115	Yes.	OK	OK
e. Common practice analysis					
a. Is this a large-scale, or first-of-its-kind small-scale project activity ?	VVM	117	No, the proposed project activity is a small scale CDM POA project activity. This is not a first-of-its kind small scale project activity.	OK	OK
b. If yes, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality ?	VVM	117	The project activity uses common practice analysis to demonstrate additionality at POA and specific CPA level. [Refer to (7.e.c)]. However, neither POA-DD nor specific CPA-DD describes and demonstrate additionality of project activity in accordance with Common Practice Analysis as provided in Combined tool to identify baseline scenario and demonstrate additionality.	CAR-21	OK
c. Was it assessed whether the geographical scope (e.g. defined region) of the common practice analysis is appropriate for the assessment of common practice related to the	VVM	118	Yes, the project scope is "manufacture and distribution of CFLs in India: - the geographical scope i.e. defined region of the common practice analysis will be based on baseline survey to be	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
project activity's technology or industry type? (For certain technologies the relevant region for assessment will be local and for others it may be transnational/global.			carried out for each specific CPA to be added in POA-DD and hence is appropriate for the assessment of common practice related to the project activity's technology or industry type if penetration of CFLs is lower in the region.		
d. Was a region other than the entire host country chosen ?	VVM	118	No, the region selected is India which is the host country only. The existing CPA is developed in Village- Golgudda in state of Andhar Pradesh which is within India i.e. host country.	OK	OK
e. If yes, was the explanation why this region is more appropriate assessed ?	VVM	118	Refer to (7.e.d) above	OK	OK
f. Using official sources and local and industry expertise, was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM/POA project activities, have been undertaken in the defined region ?	VVM	118	Demonstration of common practice analysis not correctly shown with details, refer above CAR-21, section (7.e.b)	Refer CAR-21	OK
g. Are similar and operational projects, other than CDM/POA project activities, already "widely observed and commonly carried out" in the defined region ?	VVM	118	Refer to (7.e.f) above	-	-
h. If yes, was it assessed whether there are essential distinctions between the proposed CDM/POA project activity and the other similar activities ?	VVM	118	Refer to (7.e.f) above	-	-
8. Monitoring plan					
a. Does the PDD include a monitoring plan?	VVM	120	Yes, Section 7.2 of POA-DD and section B.6.1 of	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			specific CPA-DD includes a monitoring plan.		
b. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM/POA project activity ?	VVM	120	The description of monitoring plan in not in line with the requirement and description of applied methodology AMS II C, Version 13.	CAR-22	OK
c. Were the list of parameters required by the selected methodology identified ?	VVM	121	Yes, the monitoring plan described under Section A.4.4.2 and E.7.1 / E.7.2 of the POA DD contains list of parameters required by the selected methodology.	OK	OK
d. Does the monitoring plan contains all necessary parameters ?	VVM	121	Yes, refer to (8.c) above	OK	OK
e. Are the parameters clearly described ?	VVM	121	Yes	OK	OK
f. Does the means of monitoring described in the plan comply with the requirements of the methodology?	VVM	121	No, the monitoring plan does not describe about standard practice and/or approach of collection, storage and disposal of ILs. Refer to (3.i) and (3.g) above.	-	-
g. Are the monitoring arrangements described in the monitoring plan feasible within the project design ?	VVM	121	The monitoring arrangements are in line with project design. However, refer to (3.i) and (8.b) above.	-	-
h. Are the following means of implementation of the monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM/POA project activity can be reported ex post and verified:	VVM	121			
i. data management procedures?	VVM	121	Not the data management about the record keeping of each CPA to be included in PoA is not in place. Collection, storage and standard practice/procedure for disposal of Incandescent	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Lamp is also not defined. Refer to (3.i) above		
ii. quality assurance procedures?	VVM	121	Refer to (3.y) above	-	-
iii. quality control procedures?	VVM	121	Refer to (3.y) above	-	-
9. Sustainable development					
a. Does the CDM/POA project activity assists Parties not included in Annex I to the Convention in achieving sustainable development?	VVM	123	Refer to (1.a) above. The HCA is not yet submitted.	-	-
b. Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM/POA project activity to the sustainable development of the host Party?	VVM	124	Refer to (1.a) above.	-	-
10. Local stakeholder consultation					
a. Were local stakeholders (public, including individuals, groups or communities affected, of likely to be affected, by the proposed CDM/POA project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM/POA project activity prior to the publication of the PDD on the UNFCCC website ?	VVM	126	The local stakeholder consultation is conducted at the POA level. However the following is not transparently described viz; The CPA DD is not transparent whether sufficient time was provided to the local stakeholder to provide their comments. Refer to (4.z) above	-	-
b. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM/POA project activity been invited ?	VVM	127	Yes, the local stakeholder comments were invited by conducting a local stakeholder meeting on 7 March 2009.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. Is the summary of the comments received as provided in the PDD complete ?	VVM	127	Yes.	OK	OK
d. Have the project participants taken due account of any comments received and described this process in the PDD ?	VVM	127	There were no negative comments related to project activity.	OK	OK
11. Environmental impacts					
a. Have the project participants submitted documentation on the analysis of the environmental impacts of the project activity?	VVM	129	As per the POA DD, EIA is not mandatory requirement for the proposed project activity.	OK	OK
b. Have the project participants undertaken an analysis of environmental impacts?	VVM	130	Refer to (11.a) above	-	-
c. Does the host Party require an environmental impact assessment?	VVM	130	Refer to (11.a) above	-	-
d. If yes, have the project participants undertaken an environmental impact assessment?	VVM	130	Refer to (11.a) above	-	-



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Table 2 Specific validation activities

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Project design of small-scale clean development mechanism project activities					
a. Does the proposed small-scale project activity meet the requirements of the simplified modalities and procedures for small-scale CDM/POA project activities ?	VVM	133	Yes, Refer to (3.t) and (6.a.b) above in Table – 1.	OK	OK
b. Does the project activity qualify within the thresholds of the three possible types of small scale project activities? [Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts; Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 gigawatt hours per year; Type (iii) project activities: other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually.]	VVM	134	Yes, this is a CDM-POA under which various CPAs are to be in the project. Present CPA has estimated reduction of CO ₂ e = 20 mt CO ₂ e/annum	OK	OK
c. Does the project activity conform to one of the approved small-scale categories?	VVM	134	Yes, refer to (1.a) above.	OK	OK
d. Does the project activity apply the relevant tool and methodology?	VVM	134	Yes	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
e. Are the small-scale methodologies applied in conjunction with the general guidance to the methodologies, which provides guidance on equipment capacity, equipment performance, sampling and other monitoring-related issues?	VVM	134	Yes	OK	OK
f. Is the project activity a debundled component of a large-scale project, i.e., is there a registered small-scale CDM/POA project activity or an application to register another CDM/POA project activity: (a) with the same project participants; (b) in the same project category and technology/measure; and (c) registered within the previous 2 years; and (d) whose project boundary is within 1 km of the proposed boundary of the proposed small-scale activity at the closest point?	VVM	134	Refer to (4.n) and (5.d.ii) above in Table – 1.	-	-
g. Is and assessment of the environmental impacts of the proposed CDM/POA project activity required by the host Party?	VVM	134	Refer to (11.a) above in Table-1	OK	OK
h. Is the project additional?	VVM	135	Refer to (7.c) above in Table - 1	-	-



Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p><u>CAR-1 PoA</u> <u>Host Country Approval</u></p> <p>The Project Participant description under Section A.3 of the POA DD indicates that Balaji Greentech Products Limited is the Project Participant. However the DNA approval for the Project Participant is not provided to the validation team. Also, it is not clear from the PDD section E.4 that only Balaji Greentech Products Limited is the Project Participant.</p>	(1.a)	Balaji Greentech Products Limited is the sole project participant of the PoA. The relevant documents have been submitted to the Ministry of Environment and Forests for the host country approval (HCA) process and a presentation has been made at HCA on 7th July 2010. The HCA has been attached as Annex 01.	The PP has submitted HCA approval. The HCA approval is issued by Ministry of Environment and Finance, India vide no. 4/10/2010-CCC dtd. 28-September-2010. The same is issued in the name M/s. Balaji Greentech Products Limited (Coordinating and managing entity). The title of the HCA approval is "Manufacture and Distribution of CFLs in India", hence, CAR-1 is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<u>CAR-2 PoA-DD form:</u> Followings need to be responded in POA-DD: <ol style="list-style-type: none"> 1. It is observed that, the form is altered on the first page of POA – DD. 2. The PoA-DD was completed on 10 December 2008, where as the latest version, which is applied, is available after June 2009. 	(3.a)	<ol style="list-style-type: none"> 1. The format has been corrected and updated in the revised PoA-DD. 2. The version 01 available with UNFCCC for CDM-SSC-PoA-DD and CDM-SSC-CPA-DD is applicable since EB 33 which was held from 25-27 July 2007. There are no revisions made to the version 01 of the forms by UNFCCC. 	<ol style="list-style-type: none"> 1. The PP has revised the form of the PoA-PDD version 2 dtd. 16/08/2010, which is in accordance with the latest form, hence, point 1 is closed. 2. As explained by PP, since there are no revisions after EB 33, dtd. 25-27 July 2007, the form used is latest, hence the PP has used the same, and hence this point is closed. Conclusion: CAR 2 is closed.
<u>CAR-3 PoA-DD</u> <u>Section A.3</u> The Project participant name is not clearly described in PoA-DD and in CPA-DD.	(3.e.iv)	A statement stating that 'Balaji Greentech Products Limited is the sole project participant of the PoA and all CPAs registered under the PoA' has been included in the PoA DD.	The PP has corrected revised POA-PDD and included in Section A.3 that "Balaji Greentech Products Limited is the sole project participant of the PoA and all CPAs under the program", hence, CAR-3 is closed.
<u>CAR-4 PoA-DD</u>	(3.j.i)	The nature of the project activity requires	1.The PP in the revised PoA-



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p><u>Sampling Criteria - section A.4.2</u></p> <p>The Project Participant has proposed to use the sampling method. There are two different methods used for deciding no. of samples for metered and non-metered CFL category.</p> <p>To decide the samples for 'metered CFLs' 90% confidence level with 10% error level is used. Whereas, to decided for no. of samples in 'non-metered' category, 80% confidence level with 20% error level is used.</p> <p>However, there is no justification provided, why there is a change in sampling criteria for metered and nonmetered category.</p> <p>Also, it is not clearly mentioned in PDD, whether PP has followed guidelines for sampling and surveys for small-scale CDM project activities. There is no justification provided, for changes in sampling criteria for metered and nonmetered category.</p>		<p>the project proponent to monitor the following parameters to calculate the energy savings achieved due to the implementation of the project activity:</p> <p>1. The average of the operating hours obtained in the sampling during the crediting period will be considered for calculating the actual CER. The same has been updated in Section A.4.2, point 8 of revised PoA-DD.</p>	<p>DD, section A.4.2, point 8 has clarified that the average of the operating hours obtained in the sampling during the crediting period will be considered for calculating the actual CER. Also, in the point 9 of the revised PoA-DD it is clarified that samples from 'non-metered' bulb will be taken based on 'GENERAL GUIDELINES FOR SAMPLING AND SURVEYS FOR SMALL-SCALE CDM PROJECT ACTIVITIES', EB 50 Annex 30, with 90% confidence level and 10% error. Also, PP has referred in revised PDD the sampling as per EB 65 Annex 2. A factor for non-running bulbs will be calculated and will be applied to overall CERs generated, an explanation in foot note no. 9</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>Also, it is not clearly mentioned in web hosted PDD, whether PP has followed EB guidelines for sampling and surveys for small-scale CDM project activities.</p>		<p>2. Number of operating CFLs:</p> <p>In order to monitor the number of operating CFLs at the end of each monitoring period, a sample number of CFLs will be checked by the third party to determine the percentage of inoperative CFLs. Since no metering is involved for this survey, this sample is termed as 'non-metered sample'.</p> <p>The above information has been made clear in the PoA DD.</p> <p>The fact that the project proponent has used the 'GENERAL GUIDELINES1 FOR SAMPLING AND SURVEYS FOR SMALL-SCALE CDM PROJECT ACTIVITIES, Version 01, EB 50, Annex 30' to determine the sampling and survey methodology for the PoA activity has been made clear in the PoA DD.</p>	<p>is provided, hence, point 1 of CAR-4 is closed.</p> <p>2. It is explained by PP that, for non-metered samples, the 'GENERAL GUIDELINES1 FOR SAMPLING AND SURVEYS FOR SMALL-SCALE CDM PROJECT ACTIVITIES, Version 01, EB 50, Annex 30' will be used. This will be used to determine the number of operating CFLs at the end of each monitoring period. A sample number of CFLs will be checked by the third party to determine the percentage of inoperative CFLs. It is mentioned in PoA-DD that Factor will be decided from this and will be applied on total CER generated, demonstration of this is shown in foot note</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		Similar to the metered samples, random non-metered samples would be identified to check if CFLs are working. The identified samples would be such that they will have a confidence interval of 90% with a margin error of +/- 10%. The same has been updated in Section A.4.2, point 9 of revised PoA-DD.	no.9. Based on the explanation, provided by PP, the validation team found it as conservative and hence, point 2 of CAR 4 is closed. Based on the above explanation; CAR 4 is closed.
CAR-5 PoA-DD Environmental Impact Analysis The justification for the choice of level at which the environmental analysis is undertaken is not provided.	(3.n.ii)	The environmental analysis will be done only at PoA level which includes the manufacturing facility of project CFLs along with distribution of these manufactured CFLs. The SSC-CPAs will not involve activities, which have an impact on the environment over and above the impact listed in the environmental analysis done for the PoA. A statement stating the same has been included in the revised PoA-DD. A copy of compliance of HARA is provided as DVR2_Annex 01	The PP in the revised PoA-PDD, section C.1 has mentioned that "The environmental analysis will be done only at PoA level which includes the manufacturing facility of project CFLs along with distribution of these manufactured CFLs. The SSC-CPAs will not involve activities, which have an impact on the environment over and above the impact listed in the environmental analysis done for the PoA. Since, the PoA is for manufacturing and distribution of CFLs, validation



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			<p>team has agreed to close this point, as there would be significant environmental impact in manufacturing activity, hence, PP's choice of level to execute environmental analysis is acceptable.</p> <p>PP has provided copy of documents for environmental analysis and its compliance. (Document "DVR_Annex 01") hence CAR-5 is closed.</p>
<p><u>CAR-6 Section E.1, PoA-DD</u></p> <p><u>Title of methodology</u></p> <p>The title and reference of methodology are not indicated in accordance with UNFCCC.</p>	(3.s)	The title and reference of the methodology has been provided in the relevant section, i.e. Section E.1 of the revised PoA-DD.	<p>The title and reference of the methodology is now revised in the PoA-PDD version 2, Section E.1. as, "Sectoral scope 3 – Energy Demand , AMS II.C – Demand-side energy efficiency activities for specific technologies, Version: 13 ", which is correct, hence, CAR 6 is closed.</p>
<u>CAR-7 PoA-DD</u>	(3.u)	The PoA involves following activities	The PP has explained that PoA in



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>Section E.3</p> <p>In the section E.3 of the PoA-DD describes the sources and gases in the SSC-CPA. However, during site visit, it was observed that PP is using Propane gas in the furnace. Emission of CH₄ by consuming propane is not included CDM-SSC-PoA PDD.</p> <p>Also, it was observed that at the manufacturing plant of CFL, the PP uses DG set of 600 KVA. Emission from this DG set is not described in PDD.</p>		<p>which can be accounted for project emissions:</p> <ol style="list-style-type: none"> 1. Usage of power and fuel in the manufacturing of CFLs 2. Usage of DG set to supply power for the manufacturing of CFLs <p>The project proponent uses Propane, DG set and electricity for manufacturing of CFLs (and the identified baseline). The combustion of propane and diesel results in emission of carbon di-oxide and does not emit any methane. Hence, methane emissions due to usage of propane gas have been excluded. The combustion of Propane and diesel would lead to emission of CO₂ which has been accounted in both project and baseline emissions. The usage of propane and DG set has been provided in the revised section E.3 of PoA DD. The basis for the emissions in IL manufacturing is "Techno-</p>	<p>the baseline (Manufacturing of IL) as well as in the Project (Manufacturing of CFL) there is usage of Propane and usage of DG set.</p> <p>It is explained by PP that For manufacturing of ILs, it also requires consumption of power and usage of propane, as that of CFL manufacturing. The PP has provided basis of this assumption from "Prefeasibility Report" for Incandescent Lamps (page 22 of DVR2_Annex 02), carried out by independent third party chartered accountant B.NAGA BHUSHAN & CO which is based on quotations received from M/s Precision Engineering Works for the assessment. Validation team having reviewed this, confirms the contents of documents and finds the document credible and</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>Economic Viability Report" prepared for manufacturing of ILs. The evidence for the same is provided as DVR2_Annex 02.</p> <p>The manufacturing of ILs also involves consumption of power and usage of propane. The basis of this assumption is Prefeasibility Report for ILs, carried by independent chartered accountant B.NAGA BHUSHAN & CO which is in-turn based on quotations received from M/s Precision Engineering Works for the assessment. The prefeasibility report is provided in page 22 of DVR2_Annex 02.</p>	appropriate, hence, closed CAR-7.
<p><u>CAR-8 Section E.4 PoA-DD</u> <u>Key assumption and rationale</u></p> <p>Justification of key assumptions and rationales for baseline identification are not provided in POA-DD.</p>	(3.v.ii)	The key assumptions and rationale for identifying the baseline scenario has been provided in the section E.4 of revised PoA-DD.	The key assumptions and rationale for identifying the baseline scenario have been provided in section E.4 of revised PoA-PDD., hence, CAR- 8 is closed.
<p><u>CAR-9 PoA-DD and CPA-DD</u></p> <p>Transparent illustration of all data sources which</p>	(3.v.iii)	The relevant references for the parameters considered in the 'basis' sheet has been provided in the revised	The PP has now provided revised excel sheet "Gollaguda_CPA1 CER sheet.xls". This clearly



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
are used for determining the baseline emissions is not provided in the spread sheet "Gollaguda CPA CER" provided by PP.		Gollaguda CPA CER sheet. The reference documents for the basis are "Techno-economic viability report for CFLs" and "Techno-economic viability report for ILs". Techno-economic viability report for ILs is provided as DVR2_Annex_02. The PP has considered 230V and hence percentage increase in lumen works out to be within -10% to 50% level of service (ie. light output) than baseline. The lumen output for the ILs and CFLs are sourced from IS 418: 2004.	mentions sources/reference of values. It is also explained by the PP that it has considered 230V supply voltage, which is standard voltage in India, hence, percentage increase in lumen works out to be within -10% to 50% level of service (i.e light output), which is in accordance with approved methodology AMS II C version 13, the lumen output for ILs and CFLs are sourced from IS 418:2004, which is National Technical Standards of India, hence most credible, hence CAR-9 is closed.
<u>CAR-10 Specific CPA-DD</u> The project participant has carried out a baseline survey for the specific CPA viz. Gollaguda in Dec-2008 and Jan-2009. During site visit by validation team at the Gollaguda hamlet, specific CPA, it was observed that data for IL bulbs, CFLs is different than the	(3.x.vii)	After the site visit by the validation team, the CPA implementer (BGPL) has re-done the baseline survey for the Gollaguda hamlet on 16/08/2010. Based on the information gathered in the baseline survey, the unique identification number for the locations is specified in the baseline survey format as mentioned	The PP has clarified that, after the site visit by the validation team (dtd. 25/05/2010 and 26/05/2010), the PP has carried out baseline survey once again for the "Gollaguda" hamlet on 16/08/2010. PP has provided unique identification number of



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
baseline survey. Also, the base line survey carried out by PP does not indicate unique identification no. for the residences/electricity meter no. as mentioned in Specific PDD.		<p>in Specific CPA-DD. The data obtained in the baseline survey would provide information on how many CFLs would be needed to be installed in a particular house/shop/office/etc. The actual number distribution of CFLs in the particular house/shop/office etc would be less than or equal to the sum of ILs and empty holders present in the respective house/shop/office/ during the baseline survey. The wattage of the distributed CFL would be such that the lumen output of the CFL would be within the comparable range between -10% and 50% of replaced IL. In the case of new installation the baseline scenario would be identified based on the wattage of the CFL being distributed for new installation. The source for the comparable lumen output (ie., -10% to +50% of IL lumen) would be based on the standard provided in IS 418:2004.</p> <p>The baseline survey data for Gollaguda</p>	<p>the locations (electricity consumer number) in the survey format, based on the electricity connection. The Validation team has reviewed the document "DVR3_Annex 06a_Baseline survey data_CPA_Analysis_Template.xls", which includes questionnaire, name of owner/tenant/manager, address, no. of lighting device available, average operating hours of ILs. Also, in the revised baseline survey for village Gollaguda hamlet excel file "Annex 03". This shows there are 364 nos. of ILs and 42 'CFL's which is matching with the site visit records of validation team', hence, CAR 10 is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>hamlet is provided as Annex 03. The “Baseline data CPA analysis template” itself is the questionnaire that would be used for the baseline survey. During the survey, the following data from each house/shop/office etc would be collected.</p> <ul style="list-style-type: none"> • Name of the owner / tenant / manager • Address of the residence / building / industry etc • Number of available lighting devices in the place • Average operating hours of ILs • Electricity meter number/consumer number” 	
<p><u>CAR-11 PoA-DD Section E.7.1 and E.7.2</u></p> <p>Following discrepancies were observed in section E.7.1 and E.7.2</p> <p>1. Description of measurement method is not provided in line with form and requirement.</p>	(3.y)	<p>1. The necessary measurement method in the PoA-DD is updated as per the form and requirement.</p>	<p>1. The measurement method in the section E. 7.1 is now updated, which is found appropriate, hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
2. Clarify the QA/QC procedures to be applied.		2. The QA/QC procedure to be applied for monitoring different parameters has been specified in the revised PoA-DD. The runtime meter would be calibrated once in three years. The same has been updated in revised PoA-DD	2. The QA/QC procedure to be applied for monitoring different parameters has been specified in the revised PoA-DD. This clearly mentions calibration procedure of 'run time' meter with its frequency as once in three years. This is in accordance with "General Guidelines to SSC CDM Methodologies" version 15, EB 58, Annex 23, hence, this point is closed.
3. Value of data not mentioned in any of the parameter.		3. The value of the data will be mentioned in the relevant sections of the respective SSC-CPA-DD. The value of data will not be provided in the PoA DD since it does not belong to a specific case. 4. The roles and responsibilities of the monitoring team has been updated in	3. The PP has explained that, the value of the data will be mentioned in the relevant sections of the respective SSC-CPA-DD. Validation team agrees to this, hence, this point is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>4. Description of roles and responsibilities is not complete and adequate.</p> <p>5. As per the web hosted PDD, manufacturing is part of project activity, however, monitoring does not include activity that may be required while manufacturing.</p> <p>6. It is mentioned in PDD section A.4.2.1 that manufacturing can be at other facility apart from Nandikandi village. Project emission at 'other' manufacturing site is not included in PDD.</p>		<p>the section E.7. of revised PoA-DD</p> <p>5. The monitoring parameters related to the manufacturing of CFLs have been included in the section.</p> <p>6. The PoA documents have been revised wherein the 'other' manufacturers has been removed.</p> <p>7. The specifications, range and accuracy of the runtime meter are specified in the section A.4.2.1 of the revised PoA-DD. The specifications of the runtime meters including</p>	<p>4. The PP has now described roles and responsibilities clearly in the PoA-DD, hence, this Point is closed.</p> <p>5. In the revised PoA-PDD section E. 7. 2 monitoring parameters related to manufacturing of CFLS are now mentioned, hence, this point is closed.</p> <p>6. In the revised PoA-PDD, "Manufacturing plant other than Nandikandi village is removed, hence, manufacturing is only at one place i.e. at Gollaguda, hence this point is closed.</p> <p>7. The details of run time meter such as specification,</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>7. Accuracy, range, specification of run time meter is not specified.</p> <p>8. The compatibility of 'run time meters' with BGPL make CFL is not clearly mentioned to avoid use of other type of CFLs by users in case of damage/nonworking of BGPL bulb.</p>		<p>calibration and procedure in case of damage has been provided in the revised PoA-DD. The supporting document for the manufacturer specification of the run time meter has been provided as DVR3_Annex 01 - Data_Sheet_Meter for CDM Projects.</p> <p>8. The sealing mechanism of the runtime meter has already been mentioned in the PoA-DD as footnote 36. The run-time meter would come with proper sealing mechanism (typically sealing mechanism will consist of a one-time adhesive tape/sticker which would be stuck on the holder, runtime meter and CFL). A unique number corresponding to the electricity meter number along with date of the start of monitoring period in the sample location will be mentioned on the seal. Once a CFL is fitted to the runtime meter for monitoring, the owner of the house/building will not be able to</p>	<p>range and accuracy are specified in the section A.4.2.1 of the revised PoA-PDD. The PP has also provided, manufacturer specification of the run time meter, hence, validation team has closed point 7.</p> <p>8. PP has provided sealing mechanism of 'run time meter' in PoA-DD section E.7.1. Validation team finds the description as appropriate. <u>. Also, as explained by PP, in a house/shop/user's end there might be combination of CFLs of the same CME. This can be 'free'</u></p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>detach the run time meter from the project CFL and use it with any other CFL. In case of any failure of CFL lamp or if it is observed in the non-metered sampling that the seal is broken at the end of monitoring period, it will be recorded and accounted proportionately in estimating the actual number of CERs. If say, for an example, a 5% of lamps are found to be non-operational during non-metered sampling then proportionately 5% of CERs would be deducted for the monitoring period. <u>In a house/shop there might be CFLs of the same CME with 'free' distribution and could have been as 'sold' to the end user by the PP. However, this can be differentiated by means of unique identification provided on 'free' distributed CFL, which 'sold' CFL would not have at all. Scenario 2 or Scenario 3 as explained in the additionality section of PoA DD is</u></p>	<p><u>distributed and 'sold' CFLs. However, they can be differentiated by means of unique identification provided on 'free' distributed CFL. The 'sold' CFL would not have such unique identification at all. The unique identification of project equipment is explained in 'eligibility criteria' of the PoA and CPA validation report. For the 'sold' CFLs, Scenario 2 or Scenario 3 as explained in the additionality section of PoA DD is applicable. There is no separate</u></p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
9. PDD does not describe all the parameters to be collected/recorded during the distribution of CFLS in point 1 of section. E.7.2.		<p><u>applicable for the 'sold' CFLs. There is no separate monitoring required for 'sold' CFLs as scenario 2 and 3 considers 100% sale of CFLs, still the project is additional.</u></p> <p>9. The parameters to be collected / recorded during the distribution of CFLs are provided in section E.7.2</p> <p>The Baseline_survey_data_CPA_analysis_ template has been revised. The actual data of replacement of ILs with CFLs would only be captured during the distribution stage. The baseline survey analysis would mainly be done to collect information on the number of ILs present in each house/office/shop, and average operating hours of usage. "CPA distribution" (at distribution stage) sheet</p>	<p><u>monitoring required for 'sold' CFLs as scenario 2 and 3 considers 100% sale of CFLs, even with this, the project is additional. Having reviewed above description the validation team, hence, closed the point 8.</u></p> <p>9. The revised PoA-PDD mentions all the parameters to be collected/recorded during the distribution of CFLs and is provided in Section E.7.2. The same is provided in the document "Baseline_Survey_data_CP A_analysis" template, hence, this point is</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>10. During site visit by validation team, it was informed that 'run time meters' are devoted to individual/specific CPA. The same is not described in PDD.</p>		<p>would provide the information on IL's (wattage wise) with CFL's.</p> <p>10. The runtime meters will be installed on a sample of CFLs in one SSC-CPA. The same run time meters will be rotated to a different sample of the same CPA after a period of ninety days. This will be repeated until the completion of the monitoring period of the SSC-CPA which may be the project CFL lifetime installed in the SSC-CPA region or the crediting period specified for that particular SSC-CPA, whichever is the shorter period. However, after the completion of the monitoring period for that particular SSC-CPA, the run time meters can be used for another SSC-CPA within the PoA. The manufacture specifications of the runtime meters have been included in the revised in Section A.4.2.1 of PoA-DD. The manufacturer's specification for the</p>	<p>closed.</p> <p>10. It is clarified by the PP that, the same run time meter will be used throughout the life of the CPA. After that, the same meters can be used in other CPA, however, data capturing will be identifiable for each CPA with duration of installation of run time meter. Also, PP has provided Manufacturer's specification of run time meter, viz. document "DVR3 Annex 01", validation team has</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
11. The PDD mentions in section E.7.2 point no. 3 that 'run time meters' will be shifted to another place after ninety days to take account of the seasonal variations. How ninety days can be used for seasonal variation is not justified in PDD.		<p>runtime meters is provided as DVR3_Annex 01 - Data_Sheet_Meter for CDM Projects.</p> <p>11. 90 days has been considered as number of days required for monitoring the operating hours of the installed CFL in a particular location. In a given monitoring year, a runtime meter is expected to be fixed at four different locations within a SSC-CPA region (i.e. 90x4=360). Hence if there are any seasonal variations in a year, the variations in usage of CFL operating hours will be captured by the runtime meters for determining the actual operating hours of the CFLs. The explanation has been updated and provided in the footnote 35 of revised PoA-DD.</p>	<p>reviewed this, and found appropriate, hence, this point is closed.</p> <p>11. PP has mentioned in the section E.7.2 of the revised PoA-DD that, 'run time meter' will be fixed/installed at four different locations within a SSC-CPA region (i.e. minimum 90 days x 4 locations), hence, it captures seasonal variation in a year in the same region. Validation team finds this as appropriate, hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			CAR-11 is closed.
CAR-12 Geographic reference - CPA a. The geographic reference for the CPA i.e. Gollaguda are provided in Section A.4.1.2. However, map of India is not clearly visible, also, format for Longitude and latitude for India, which covers CPA is different than PoA-DD. b. Clear relation of Gollaguda hamlet, Medak district, Sadaseovpet not described.	(4.d)	a. The reference for the Latitude and longitude has been mentioned in revised PoA-DD b. Gollaguda is hamlet located in Sadaseopet mandal in Medak district	a. The geographic reference for the PoA is corrected. The same are mentioned as Latitude – 6°44' N and 35°30' N, Longitude –68°7' E and 97°25' E for PoA and for CPA it is mentioned in revised CPA PDD as: Latitude: 17° 30' 15" N, Longitude: 78° 05' 03" E. The PP has mentioned source of longitude and latitude in the revised PoA-DD and CPA-DD. The same is http://wikimapia.org . The validation team reviewed this and closed the point . b. It is clarified that Gollaguda hamlet is in Sadasivpet mandal of Medak district in



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
c. The names and contact details of the entity / individual responsible for the CPA is not indicated, as required by the completeness guidelines for CPA form.		of Andhra Pradesh. The same has been updated in the revised SSC-CPA-DD. c. The name and contact details of the entity/individual responsible for CPA-DD is already indicated in Section A.3 and Annex 1 of the CPA-DD.	Andhra Pradesh in the revised CPA-PDD, which is correct, hence, point b is closed. c. The name and contact details of the entity (M/s Balaji Greentech Private limited) is indicated in section A.3 and Annex 1 of the CPD-DD, which are consistent, hence this point is closed. Conclusion: CAR 12 is closed.
CAR-13 Emission Reduction The information on estimated amount of emission reductions over chosen crediting period is provided correctly in tabular format. However, the calculation of emission reduction is not correct, as it does not consider the emissions	(4.I)	<u>As described in the methodology, the estimated emission reductions are due to project activity equipment only. The same has been calculated due to use of CFL in place of IL. Also, for checking purpose only the emissions due consumption of power and propane is calculated. The same is less than 1% hence, in any case,</u>	The project participant <u>explained that as per the methodology, the emission reduction is due to project equipment only, which is use of CFL in lieu of IL at the user end. Hence, the emission reduction is at the user end, hence, use of propane and power</u>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
due to manufacturing of CFLs, including grid electricity consumption, propane, consumption and diesel used in DG set in case of exigency.		<u>this can be neglected.</u>	<u>is not required to consider. Also, as an additional check, when this is considered the total emission reduction due to this is less than 1% (0.77%), hence, as per VVM Para 77, this can be neglected, hence, CAR 13 is closed.</u>
CAR-14 Boundary There is a description of the sources and gases detailed in section B.4 of the specific PDD. However, it is not demonstrated that the SSC CPA is located within the geographical boundary of the POA.	(4.s)	The statement " <i>The above mentioned coordinates of Gollaguda hamlet lie within the latitudes (6°44' N and 35°30' N) and longitudes (68°7' E and 97°25' E) which encompass India, the PoA region</i> " along with the reference has already been mentioned in the CPA-DD.	It is clarified in the revised PoA-DD that, the proposed CPA area i.e. Gollaguda hamlet lie within the latitudes (6°44' N and 35°30' N) and longitudes (68°7' E and 97°25' E) of India, hence, CAR 14 is closed.
CAR-15 Local stake holder meeting Local stakeholder consultation process is at the PoA level. However, the choice is not justified. The PoA level stakeholder meeting is conducted on 07/03/2009. In the CPA DD it is not transparently mentioned whether sufficient time was provided to the local	(4.z)	In the current PoA, the local stakeholder consultation process is carried out at the PoA level and not at the CPA level (as stated in section D.1 of PoA-DD). The Section D.2 of the PoA-DD has been revised and updated. The invitation letters were issued on 11/02/2009 along with the questionnaire. The filled in questionnaire	It is clarified by the PP that in the PoA, the local stake holder consultation is done at PoA level. Also, it is mentioned in section D.2 that, the invitation letter were issued on 11/02/2009 and stake holder meeting was held on 07/03/2009, hence, time to

Supprimé: As described in the methodology, the The

Supprimé: have been updated after the correction. The same has been mentioned in the Section A.4.4 of the revised CPA-DD.

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Supprimé: has revised the calculation of emission reduction which now includes the emissions due to manufacturing of CFLs, including grid electricity consumption, propane, consumption and diesel used in DG set in case of exigency. However, the emissions in baseline scenario due to operation of the IL manufacturing facility are also considered in baseline emissions. Validation team reviewed baseline emission calculations based on pre-feasibility report and confirms that the values used in base line emission are correct.¶
The PP has provided estimated emission reduction in the PoA-DD section A.4.4, which are consistent with the spreadsheet provided by PP for Emission Reduction of Gollaguda CPA, **hence, CAR-13 is closed.**



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
stakeholder to provide their comments.		were collected during the stakeholder meeting, providing more than 20 day to provide the comments. Hence sufficient time has been provided for the stakeholders to give the comments on the projects.	provide comments was 20 days, which is found sufficient, by the validation team, hence, CAR-15 is closed.
CAR-16 Section A.2 The description of the pre-project and the project activity is not transparently described in the POA DD. Ex. For a given lumen output, CFLs consume up to one-fourth (approx.) of power of an equivalent ILs causing reduction in requirement of electricity from the connected electricity grid, which predominantly uses fossil fuel for electricity generation. Supporting evidence is not provided for the same. <ol style="list-style-type: none"> In Specific CPA DD - Quantity does not match in the table, what are other lighting devices than CFL, IL is not clarified. 	(5.a)	In the description of pre-project scenario, the supporting evidence for the said statement is provided in the revised PoA-DD. <ol style="list-style-type: none"> The revised table is provided in the CPA DD. The runtime meters which are being 	<ol style="list-style-type: none"> In the revised CPA – DD in section A.2, the total lighting devices in the table is corrected, hence, this point is closed. The PP has explained that

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
2. It is mentioned that 'Run meters will be installed in the holders of the project CFLs to capture the usage of CFLs' – How does PP ensure that meters starts from 'zero', what are the checks of run meter and configuration of run meter are not clarified.		planned in the CPA would typically have 3 types of data sharing mechanism viz., through saving data in non-volatile memory, through a PC interface connected to microcontroller and through a GSM module. During every switch-on of the lamp the GSM module would send data for the previous cycle through SMS to a wirelessly connected server located either at BGPL or any third party appointed for the purpose in a non-editable mode. A PC interface will be available which can be connected to the runtime meter through a USB Dongle. The runtime meter also has an internal memory of 16MB which has a life of 10 years. All the data stored in the memory can be downloaded to a wireless device, whenever required. As said, the device will store the data internally and also update the data in the server through GSM facility. Once the	run time meter will have 16 MB memory and data can be stored for 10 years. The data transfer would be through GSM module. This is found explained in the PoA-DD, also specification of 'run time meter' is provided to the validation team. Validation team reviewed this, and found it appropriate; hence, point 2 is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
3. During the validation team's site visit, it was informed that run time meters will be devoted to particular CPA, which is not transparently described in Specific/PoA PDD.		<p>monitoring is completed for one location for 90 days, the meter would be shifted to another location. Based on the meter number available at the location, the data saved and recorded can be corresponded to a particular meter and unique identification number. As erroneously stated earlier the meter will not have reset option. The same has been stated in section E.6.3 of PoA-DD.</p> <p>3. As stated above in CAR 11, point 10, the runtime meters used for monitoring purpose will not be specific for a particular CPA. The runtime meter being used for the sampling would be replaced before the end of its life for future analysis. For example, if a meter has been used for operating life of 4 year 11 months, then such meters would not be used for further installations. Moreover, the data from the runtime meters would</p>	<p>3. It is clarified by the PP that, the run time meters can be used till the crediting period of the CPA, and after that, it can also be used in another CPA. However, data can be stored for ten years. It is also clarified that, the working conditions of the runtime meters would be periodically checked (after end of each cycle of 3</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>be manually downloaded every month. This would further enable the project proponent to check operating conditions of the runtime meter. The same has been mentioned in Section E.7.1 of PoA-DD.</p> <p>3a) The working conditions of the runtime meters would be periodically checked (after end of each cycle of 3 months). Moreover, the data from the runtime meters would be manually downloaded every month. This would further enable the project proponent to check operating conditions of the runtime meter. If the runtime meter becomes defective, the meter would be immediately replaced with a new meter. If a meter is found to be defective during the monitoring period then the readings of the same will not be considered for calculation of actual CERs</p> <p>3b) Runtime meters would be replaced</p>	<p>months) and the data from the runtime meters would be manually downloaded every month. If the runtime meter becomes defective, it would be immediately replaced with a new one. If a meter is found to be defective during the monitoring period then the readings of the same will not be considered for calculation of actual CERs. It is also clarified that, the data from the meters would be stored electronically till the end of crediting period; hence, this point is closed.</p> <p>CAR-16 is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		with a new set of runtime meters at the end of its life. However the data from the meters would be stored electronically till the end of crediting period.	
<p>CAR-17 Financial Considerations Following points are not clearly described in POA-DD.</p> <p>1. In substep-2 (a) Barrier analysis: as per PDD statement "Market study done by BGPL indicates that the market size of CFLs in India is 125 million compared to 900 million market for ILs. This is not substantiated with supportive.</p> <p>2. Out come of step-2 includes the identification</p>	(6.d.a)	<p>1. The market size of CFLs in India is about 200 million in 2008. The penetration of CFL in housing sector is only about 5-10%. The statement has been revised in the PoA-DD. The source has been revised and is available at the below weblink http://www.indg.in/rural-energy/policy-support/bachat-lamp-yojana</p>	<p>1. The PP has corrected "market size of CFLs in India" which is mentioned in section A.4.3, under heading 'barrier analysis'. The same is supported by the link "http://www.indg.in/rural-energy/policy-support/bachat-lamp-yojana", the link provided is a public domain. Paragraph 2 of the same is describes that there is a CFL market of about 200 million in India in 2008, hence, point 1 is closed.</p> <p>2. In the revised PoA-DD, the</p>



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of most plausible baseline scenario, but the same has not be explicitly explained how that is the most plausible scenario Project Participant could have opted for in absence of project activity.		2. As explained in the Section E.4 of PoA-DD, <i>Barrier analysis</i> , it is clear and evident that the penetration of energy efficient CFLs in India is much lower compared to the ILs. Even during the baseline survey and validation site visit to the Gollaguda hamlet, the same was observed to be true. Hence in the absence of the project activity, setting up and a manufacturing facility for ILs and distributing these ILs through an already established distribution network would be the most plausible scenario. As stated in PoA-DD, the baseline identified will not face the investment and common practice barriers, as is the case with the project activity. The identification of the baseline scenario has been updated as per version 17 of General Guidelines to SSC CDM methodologies.	Baseline identification is done as per latest guideline to SSC CDM methodology version 17, hence, point 2 is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>3. In Step 3 : IRR comparison for production and distribution of IL and CFL is not provided for similar no. of production capacity, with same investment.</p>		<p>3. The financial IRR comparison for production and distribution of IL and CFL is done based on the available production line capacities of CFLs and ILs in the market. The manufacturing capacities of baseline scenario and project scenario are different as the standard production lines available for manufacturing of ILs and CFLs are 2000 bulbs/hr and 1200 lamps/hr respectively. Considering two production lines of 1200 lamps/hr in the project activity, returns on 2400 CFLs/hr plant has been compared with the 2000 IL/hr plant. Hence returns on manufacturing ILs and CFLs are derived and compared. The quotations for the CFL and ILs productions are provided as DVR3_Annex 04</p>	<p>3. PP has provided IRR comparison for production and distribution of IL and CFL. The two lines of CFL having capacity of 2400 CFLs per hours are compared with IL Production line of 2000 per hour. Since, these are the manufacturing lines available in the market, which is observed from the quotations of the manufacturers (Ref. Quote 1) For the line 1 quotation PEW/QTN/121/2007-08 dated 21-11-2007 (For 1200 CFLs/hour) and for line 2 (1200 CFLs/hour) from M/s. Precision Engineering works letter no. PEW/QTN/116/2009-10 dtd. 14-09-2009 and 2) For 2000</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>4. It was observed and discussed during site visit that the replacement of IL bulb will take place on sampling survey basis. However, it is not clear with respect to baseline identification that how Project Participant will ensure/decide the remaining lifetime of IL being replaced with CFL. Also, mechanism to ensure baseline equivalent to complete lifetime of CFL is not explicitly described in baseline identification.</p>		<p>4. As stated above, in the absence of the current PoA, the scenario existing the baseline would continue in the region identified for CPA. Hence at the end of life of IL, it can be assumed that at the household/shop/office owner would opt for lighting device which is available at a lower price which is IL. This is rationally true considering the fact that the cost of CFL acts as hindrance to its wide usage.</p>	<p>ILs/hour. From M/s. Precision Engineering works letter no. PEW/QTN/GLS/2008-09 dtd. 15-09-2008). Validation team finds this as appropriate, hence, closed the point.</p> <p>4. It is clarified by the PP that, in case of IL already in usage, hence, remaining life is not full life of an IL. However, PP has clarified that, even in case of existing IL, where new CFL is provided, due to cost constraints of the CFL against that of IL, the consumer in future would turn to use of IL only, and not that of CFL. Validation</p>



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			<p>team agrees to this, as there is much price difference in the IL and CFL, hence, this point is closed.</p> <p>All the points of CAR are closed, hence, the CAR is closed.</p>
<p>CAR-18 Common Practice Barrier</p> <p>The common practice barrier analysis is used to demonstrate the additionality of each SSC-CPA in specific CPA.</p> <p>However, following is not justified:</p> <p>PDD mentions, "Lighting consumes about 20% of electricity" this is supported by footnote no. 4, which has website reference. However, Authenticity of the article/webpage is not demonstrated. (Same is for foot note no. 5)</p> <p>(Common practice) Barriers due to prevailing</p>	(7.a)	<p>The common practice barrier has been removed in the revised PoA-DD. The CPA-DD and generic CPA-DD has been updated accordingly.</p> <p>The following link http://cdm.unfccc.int/ProgrammeOfActivities/registered.html from the official website of UNFCCC indicate that there are only two(2) registered PoA's in India. Among the two, only Bachat Lamp Yojana (BLY) (Registration no:3223) involves</p>	<p>The PP has removed the common practice barrier in the revised PoA and CPA DD. Also, for one of its kind project, PP has demonstrated through UNFCCC link, there are only 2 projects of CFLs are registered, but current project is different from them. However, PP has not used this for the demonstration of additionality. Instead, the investment comparison has been used as for the Demonstration of Additionality, hence, the CAR is</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>practice : It is not proven that the proposed project activity is one among the first of its kind in the geographical area.</p> <p>It is not justified as to how the CDM revenues would alleviate all the barriers discussed in the POA and CPA DD.</p>		<p>replacement of ILs with CFLs. However, this replacement in BLY programme is different from the current project due to following reasons:</p> <ol style="list-style-type: none"> 1. BLY is only distribution of CFL , where as current project is manufacturing and distribution of CFL 2. BLY distributes CFL at INR 15 per CFL, where as current project distribute CFLs for free. <p>Considering the above reasons it can be justified that the proposed project activity is one among the first of its kind in the geographical area.</p> <p>The barriers which impede the implementation of the project is the investment barrier. Without CDM revenues, the returns in the manufacturing and distribution of CFLs is much lesser compared to the ILs. It is evident from the analysis that, with CDM</p>	closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		revenues, the returns in the project is considerable better than the previous scenario and higher than the returns on the ILs project. Hence this barrier has been alleviated.	
<p>CAR-19 Investment Analysis Following details are observed in investment analysis submitted:</p> <p>1. It is stated that Investment Comparison Analysis is used to demonstrate the additionality. However, it is not explained why Investment comparison analysis is used.</p>	(7.c.g)	<p>➤ The project activity has a baseline scenario of manufacturing and distribution of ILs through an established network. The demonstration of additionality is provided in section A.4.3. The Sections A.4.3 and Section E.4 are corrected and updated in the revised PoA-DD</p> <p>As per the “Guidance on the Assessment of Investment Analysis, version 2, EB 65, Annex 5”, the guidance on investment comparison analysis is as follows: 19. Guidance: <i>If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the</i></p>	<p>1) The PP has used the latest version for investment Analysis and had justified the choice of investment comparison in the PoA-DD in accordance with the investment analysis guideline, having reviewed this, validation team finds “investment comparison” as appropriate approach for the investment analysis in line with EB 65, Annex 5, hence, this point is closed.</p>



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		<p><i>same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.</i></p> <p>Hence, the investment comparison analysis is being done for the project activity at PoA level.</p> <p>The latest SSC WG 29 guideline, which is further accepted in EB 59 has not been considered while demonstrating additionality. The project involves both manufacturing and distribution of CFLs, hence the same is not applicable to the project activity.</p>	
2.) Clarify the cost of CFLs. Will it be free of		2) The CFLs will be distributed free of	2) It is mentioned in the revised PoA-PDD that distribution of CFL



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>cost or chargeable by nominal amount, which is taken as Rs. 15 for IRR calculations.</p> <p>3) PL. Clarify the financial indicator. It is Project IRR or Equity IRR or NPV as the table shows both IRR and NPV.?</p>		<p>cost under the program. The same has been revised in the PoA DD.</p> <p>3) The investment analysis for the PoA has been revised as follows: ✓ At PoA level, the approach of investment comparison analysis has been taken. The investment analysis will be done for the baseline and project activities. The data available with project proponent for the manufacturing facility of ILs is for production of 2000 bulbs/hr. This production capacity does not match with the production capacity of the CFL manufacturing facility. Hence, the cost of manufacturing and distributing one CFL will be compared with the cost of manufacturing and distributing one</p>	<p>would be free of cost, hence, this point is closed.</p> <p>The PP has provided financial indicator for assessing the project viability in revised PoA-PDD. The same is "Unit cost of manufacturing and distributing a light bulb." Spreadsheets for financial calculations are submitted by the PP. In the excel files PP has clarified that source of all assumption is "Technical Analysis report of BGPL" this is done by M/s. B. Nagabhusha & Co, Chartered accountant who has referred inputs from M/s. G. Ashokkumar & Associates, Secundarabad who is a chartered engineer, Govt. Registered valuers and project consultants. PP has now considered</p>



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		<p>IL. The debt component of the project cost has also been taken into the calculations. It is clearly shown that the baseline activity is less costly than the project activity. As per the requirements of EB 63, Annex 2, "STANDARD FOR DEMONSTRATION OF ADDITIONALITY OF GHG EMISSION REDUCTIONS ACHIEVED BY A PROGRAMME OF ACTIVITIES", an eligibility criteria has been set in PoA-DD to check that CPA included registered PoA meets this criteria. The financial indicator for assessing the project viability is revised in the PoA-DD, which is IRR. As per the requirements of EB 63, Annex 2, "STANDARD FOR DEMONSTRATION OF ADDITIONALITY OF GHG EMISSION REDUCTIONS ACHIEVED BY A PROGRAMME</p>	<p>investment comparison analysis to demonstrate the additionality of the proposed PoA. The same is carried out at PoA level, having reviewed the approach, validation team accepts this. Also, the eligibility conditions for inclusion of CPA are included in line with the EB 63, Annex 2, hence, this point is closed. The PP has provided financial indicator for assessing the project viability in revised PoA-PDD. The same is "Project IRR." Spreadsheets for financial analysis are provided to the validation team. In the spreadsheets, the PP has clarified that source of all assumption is "Technical Analysis report for BGPL", carried out by M/s. B. Nagabhushan & co. The technical inputs are from M/s. G. Ashokkumar & Associates,</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>4) IRR without CDM is not mentioned in case of project scenario in the table provided.</p> <p>5) Clarify the consideration of the term loan and its interest in decision making with required</p>		<p>OF ACTIVITIES", an eligibility criteria has been set in PoA-DD to check that CPA included registered PoA meets this criteria. A crosscheck will be done to check that the included CPA meets the additionality criteria as presented in PoA-DD. At both PoA level and CPA level investment comparison analysis will be used for assessing the additionality of the programme.</p> <p>4) IRR without CDM is mentioned in case of project scenario in the table provided. IRR has been considered as the financial indicator for the project.</p> <p>5) The term loan sanction letter has been provided as Annex 05.</p>	<p>Secundarabad who is a chartered engineer, Govt. Registered valuer and project consultants, validation team reviewed this and finds that sources mentioned are correct, hence, this point is closed.</p> <p>4) IRR without CDM is mentioned in case of project scenario in the PoA-DD and in the financial spreadsheet provided by the PP, hence, this point is closed.</p> <p>5) The term loan sanction letter has been submitted by PP (Annex 11 - SBH_Bank Loan Sanction Letter). The letter from</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>supportive.</p> <p>6) The financials are calculated only for 10 years. This is not clarified why they are calculated only for 10 years.</p>		<p>6) The financials calculations for the PoA activity have been done for 20 years which is in line with the CDM guidelines. The financial calculation sheet is provided as Annex 06. However, the financial calculations done by project proponent in the DPR is for 10 years which has been provided to DOE earlier by project proponent.</p>	<p>"state Bank of Hyderabad" bearing no. F/ADV/Balaji Greentech/8 dtd. 16-04-2008 is attached. It mentions term loan of Rs. 9.70 Crore and interest rate of 1.5% below SBHLR (minimum 11.50%) p.a., hence, this point is closed.</p> <p>6) The PP has now provided financial calculations for 20 years. This is equal to the equipment life time, as clarified by the manufacturer vide letter dated 08/05/2012, hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
7) Sources of input values are not mentioned in entire financials submitted for validation of project activity.		5) The source of input data for financial calculation has been provided in the sheet. The basis for the input values used in salary and wages are provided in the updated PoA_IRR sheet. The sheet is provided as DVR3_Annex_03. As stated, the sources for all the financial parameters have been taken from Techno-Economic Viability Report which are in-turn sourced from various quotations received for carrying out the analysis. The same is endorsed by the financing bank. The supporting documents are shared as DVR3_Annex 04.	7) The sources of input data for financial parameter "Source: Techno-Economic Study Report provided by BGPL – the study carried out by M/s. G. Ashokkumar & Associates, Secundarabad who is a chartered engineer, Govt. Registered values and project consultants., hence, validation team accepts this as 3 rd party appropriate source as input parameters, hence, this point is closed. CAR 19 is closed.
CAR-20 Investment Analysis The values used in the PDD are not in accordance with the report mentioned above. The IRR value as per the report is 71.38% with CDM revenue.. The complete presentation of the results of investment analysis are not according to the Techno-Economic Viability Study Report.	(7.c.m.ii)	The investment comparison analysis has been re-presented in the PoA-DD and CPA-DD. IRR is being used as the financial indicator for comparing the returns on the manufacturing and distribution of CFLs and ILs. The source for all the assumptions carried out is provided.	The investment comparison analysis has been re-presented in the revised PoA-DD and revised CPA-DD, wherein IRR is being used as the financial indicator for comparing the returns on the manufacturing and distribution of CFLs and ILs. The



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			source for all the assumptions carried out for financial working is provided in the financial spreadsheet, hence, CAR is closed.
CAR-21 Common Practice The project activity uses common practice analysis to demonstrate additionality at POA and specific CPA level. [Refer to (7.e.c)]. However, neither POA-DD nor specific CPA-DD describes and demonstrate additionality of project activity in accordance with Common Practice Analysis as provided in Combined tool to identify baseline scenario and demonstrate additionality.	(7.e.b)	The common practice barrier has been removed in the revised PoA-DD. The CPA-DD and generic CPA-DD has been updated accordingly.	The common practice analysis has been now removed from the revised PoA-DD, hence CAR-21 is closed.
CAR-22 Monitoring plan The description of monitoring plan is not in line with the requirement and description of applied methodology AMS II C, Version 13.	(8.b)	The monitoring plan is in line with the requirement of applied methodology AMS II C, Version 13. (Point no. 11 to 15). The point number 17 of the methodology has also been referred. As per the point 17, an independent monitoring of scrapping of replaced equipment would be implemented, recorded and	The PP has revised monitoring plan in the section E.7.2 of revised PoA-PDD, which involves Para related to monitoring of the project, however, the PoA-DD now describes the disposal of ILs as per the CPCB "Guidelines for Environmentally Sound Management of Electronic Waste", as mentioned in



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		documented for independent verification. As stated in the footnote 39, the disposal of ILs would be carried out as per the CPCB "Guidelines for Environmentally Sound Management of Electronic Waste". The same has been updated in the revised PoA-DD.	response of CAR, hence CAR-22 is closed.
CL-1 Coordinating and managing Entity It is not clearly mentioned in line with PoA-guidance and form as who is coordinating and managing entity and who is Project Participant.	(2.a)	For the current project activity, BGPL is both the coordinating and managing entity as well as the project participant.	It has been stated in Section A.3 and Annex 1 of POA DD and Specific CPA DD that Balaji Greentech Products Limited will be sole coordinating and managing entity for POA as well as each CPA, hence, CL-1 is closed.
CL-2 Description of the project activity The description of the project activity covers following points which require further clarification: 1. Life of the ILs could not be found in reference "1" provided in PDD.	(3.d.i)	1. The reference has been updated in revised PoA-DD. The exact references for the page/clause numbers have been provided in the revised PoA_DD.	1) In the footnote 2, PP has provided link http://www.esi.iitb.ac.in/~suryad/Lighting-CEP.pdf page no. 15 of this mentions life time of IL and CFL. This is a 3 rd party publicly available



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			document, which is from CEP Course on Energy Management, at IIT Bombay found credible, also, hence, this point is closed. However, PP has provided test reports to demonstrate that CFLs manufactured by PP have power factor more than 0.8 and its lifetime is 6000 hours. The tests are conducted by National Physical Laboratory (Council of Scientific and Industrial Research), New Delhi, vide various test reports for 7,9,15,20,26 Watt CFLS manufactured by M/s. Balaji Greentech Products Ltd., Hyderabad. (Refer Annexure 1- Test Certificates), PP in section A.4.4 of the CPA DD has



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2. It is stated that CFL consumes up to one-fourth of power of equivalent ILs. Please provide evidence for this and substantiate the same.		2. The reference, the approximate consumption of power by CFL when compared to IL has been changed and updated. The CFL would consume approximately one-fifth of power when compared with IL. The exact references for the page/clause numbers have been provided in the revised PoA_DD.	<p>clarified that it will claim emission reduction based on actual running only, hence, this point is closed..</p> <p>2. PP in the revised PoA-DD has mentioned that, the approximate consumption of CFL is one-fifth of power when compared with IL. This is supported by the weblink of Bachat Lamp Yojna of Bureau of Energy Efficiency, (http://www.bee-india.nic.in/bly/BLY_manual.pdf) which is a Central Government organization of India, hence found this source as appropriate, hence, point 2 is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
3. Clarify the areas where BGPL is planning to distribute CFLs. Also, implementation plan is not clearly described i.e. series of activities leading to distribution of CFLs of BGPL.		3. The areas where BGPL is planning to distribute CFLs over next 28 years (crediting period of PoA) could be a combination of villages, mandals, districts, localities, townships, states, within the geographical coordinates of India. The implementation plan for distribution of CFLs has been updated in PoA DD.	3) The project participant has mentioned that whole India can be covered under PoA, This is clearly mentioned in section A.4.2 of the revised POA DD, hence, point 3 is closed. CL-2 is closed.
CL-3 Section A.2 PoA-DD The explanation of how the project activity would help in GHG emission reductions are explained in Environmental well being section. However, following points are not clear in terms of how the GHG emissions are effected. PDD mentions "Decrease in usage of grid power reduces usage of fossil fuels and green house gas emissions in the electricity grid: Description of how this green house gas emission in the	(3.d.ii)	The statement has been updated in the revised PoA-DD and CPA-DD.	The revised PoA-PDD mentions about reduction of green house gas associated with the grid power, in the section A.2, which is found appropriate, hence CL-3 is closed.



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electricity grid is not evident in the PDD for Environmental Well Being.			
<p>CL-4 PP's view on the contribution of project activity is not clear in following points.</p> <ol style="list-style-type: none"> 1. First three points of Social Well Being are not clear with respect to social well being in the region. 2. It is stated that the penetration rate of CFL in India is very low. Provide statistics with respect to time and penetrated quantity in Technological Well Being. 	(3.d.iii)	<p>1) The programme involves displacement of energy in-efficient lighting devices with efficient ones in the identified CPA region. Hence the programme helps in increasing the penetration of energy efficient lamps in the region. Also, the project activity would generate both direct and indirect jobs in the region. The documentary evidence for employment generation is provided as DVR2_Annex 04</p> <p>4. The link for the relevant statistics has been provided in the revised PoA DD.</p> <p>2. A revised source to show the penetration of CFLs in India is provided in revised PoA documents. The penetration rate of CFL in India is very low. The reference document for the</p>	<ol style="list-style-type: none"> 1) A challan for PF contribution and ESIC contribution is submitted by PP in the document viz. DVR2_Annex 04, which shows employment generation from the Balaji Greentech i.e. PP, due to project activity, hence, point 1 is closed. 2) For the Penetration rate of CFL in India (5-10%), PP has provided authentic document of Bachat Lamp Yojna, (http://www.bee-india.nic.in/bly/BLY_manual.pdf) This is published by the Bureau of Energy Efficiency, which is a



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<p>3. It is stated that: "The CFLs distributed in the PoA would have minimum quality standards....</p> <ul style="list-style-type: none"> ✓ Power factor of 0.8 more ✓ Minimum rated lifetime of 6,000 hrs" <p>Provide evidences for the validation test reports/tests conducted.</p>		<p>penetration level CFL has been provided in the revised 'Technological well-being', Section A.2 of PoA-DD.</p> <p>3. The test reports are provided prior to the DVR through courier.</p>	<p>Central Government organization, hence, validation team accepts this as appropriate document, hence, point 2 is closed.</p> <p>3) The PP has provided various test reports to demonstrate that CFLs manufactured by PP have power factor more than 0.8 and its lifetime is 6000 hours. The tests are conducted by National Physical Laboratory (Council of Scientific and Industrial Research), New Delhi, vide various test reports for 7,9,15,20,26 Watt CFLS manufactured by M/s. Balaji Greentech Products Ltd., Hyderabad. (Refer Annexure 1- Test</p>

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<p>2. Voluntary action:</p> <p>It is stated that there is no mandate of usage of CFLs in India but the Project Participant is involved in mfg and distribution of CFLs. Please explain how the voluntary participation is established.</p>		<p>manufacturing of CFLs, the project participant intends to sell some of the CFLs in the retail market at a price of 30 & 50 INR for single and double lamp respectively. The project proponent will not claim the CER revenues for such CFLs sold in retail markets. The revenue from the sale of CFL in the retail market has been considered to prove the additionality for the project.</p> <p>2) There is no mandate given by the Government of India, which requires the project participant to manufacture CFLs and distribute these CFLs free of cost. Hence the project is clearly a voluntary participation.</p>	<p>knowledge agrees to this, and hence, this point is closed.</p> <p>Conclusion : CL-5 is closed</p>
<p>CL-6 Boundary</p> <p>The physical boundary of India is described by</p>	(3.f.iii)	The required information is updated in the	Following latitude and longitude are provided by the PP in the



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means of map. However, the map is not clear, also, there are differences found in map for CDM-SSC-PoA and CDM –SSC-CPA and Specific-CPA map. Also, the format of Lat – long is different in SSC-PoA and SSC-CPA and Specific-CPA.		documents.	<p>section A.3 of the PoA-DD for the manufacturing plant.</p> <p>Latitude – 6°44' N and 35°30' N</p> <p>Longitude –68°7' E and 97°25' E</p> <p>the location source is from the weblink www.wikimapia.org</p> <p>For the CPA, the latitude and longitude are provided, as</p> <p>Latitude – 6°44' N and 35°30' N</p> <p>Longitude –68°7' E and 97°25' E</p> <p>Which is correct as first CPA is Gollaguda, where manufacturing plant is located., hence, CL-6 is closed</p>
<p>CL-7 section A.4.2</p> <p>Following points require clarifications in CDM PoA DD, section A.4.2 :</p> <p>1. In point no. 2: in PoA DD mentions “The project proponent may employ a third party agency to carry out the baseline survey of the selected region. – Clarify for qualification criteria / minimum education / training for third</p>	(3.g)	<p>1. The qualification criteria / minimum education / training for third party agency / people employed by third party agency are stated in Section A.4.2 of revised PoA-DD.</p>	<p>1. In the revised PoA-PDD, Section A.4.2, the qualification criteria / minimum education / training for third party agency / people</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>party agency / people employed by third party agency.</p> <p>2. Point no. 3: It is stated that “the disposal of the ILs will be done according to the prevailing standard practice for which adequate records will be maintained and made available to the DOE” – Please specify/clarify what is the standard practice for disposal of ILs in India. Also, describe the approach that will be adopted for collection and disposal of used ILs that are replaced by CFLs.</p> <p>3. Point no. 4: It is mentioned that “The CPA implementer will either distribute the CFLs for</p>		<p>2. The statement has already been provided as point 5 and point 10 under section A.4.2 of PoA-DD. A standard practice as prescribed by the respective regulatory body at the time of disposal will be adopted for the programme. The disposal procedure would be in line with the requirement of CPCB. In addition, a footnote stating the disposal practices has been added as footnote 39 in the updated PoA-DD.</p> <p>3. As stated in the revised PoA-DD, the</p>	<p>employed/to be employed by third party agency are stated, hence, this point is closed.</p> <p>2. It is clarified by PP and mentioned in section A.4.2 of the PoA – DD that disposal of IL will be as per standard practice as prescribed by the respective regulatory body at the time of disposal will be adopted for the programme. The disposal procedure would be in line with the requirement of CPCB. In addition, a footnote stating the disposal practices has been added as footnote 30 in the updated PoA-DD, hence, this point is closed.</p> <p>3. It is clarified in the revised</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>free or attach a minimum cost to the CFLs" what is the minimum cost considered for each CFL type, pl. clarify. It was observed during site visit of validation team that first CPA as decided by BGPL i.e. Village Gollaguda is surveyed and free distribution of CFL is planned. Please clarify.</p> <p>4. Point no. 6 : It mentions -installation of run time meters for 3 months at one place and after this period they will be installed at other place, to know the effect of climatic changes on the CFL usage. – During site visit of validation team it was discussed that this run meters are dedicated to each CPA. Also, clarify technical details including accuracy and calibration of these meters. Also, Disposal/reuse of this 'metered sample 100 nos. CFLs' is not clearly described in PDD.</p>		<p>project proponent will be distributing the CFLs for free of cost.</p> <p>4. The run time meters will keep rotating within the same CPA till the completion of the crediting cycle of this particular CPA. The run time meters can be shifted to a new CPA after the completion of the crediting period of CPA.</p> <p>The runtime meters which are being planned in the CPA would typically have 3 types of data sharing mechanism viz., through saving data in non-volatile memory, through a PC interface connected to microcontroller and through a GSM module. During every switch-on of</p>	<p>PoA-DD that the CFL will be distributed free of cost, hence, this point is closed.</p> <p>4. PP has clarified that run time meters will be kept rotating within the CPA, and can be shifted to a new CPA after completion of the crediting period of CPA, also calibration will be atleast once in three years. This run time meter will have storage memory. PP has provided clear description of Run time meter in PoA-DD section A.4.2 and A.4.2.1, having reviewed this, the validation team finds this as appropriate, hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
5. Point no. 6: It is mentioned in PoA-DD that sampling will be for 100 nos. of representatives. It is not clearly mentioned if these are of same wattage or different.		<p>the lamp the GSM module would send data for the previous cycle through SMS to a wirelessly connected server located either at BGPL or any third party appointed for the purpose. A PC interface will be available which can be connected to the runtime meter through a USB Dongle. The runtime meter also has an internal memory of 16MB which has a life of 10 years. All the data stored in the memory can be downloaded to a wireless device, whenever required. The meters will be able to record the voltage, current, energy and usage hours throughout the life of meter.</p> <p>The runtime meters being installed will have a life of 5 years and will be calibrated once in three years.</p> <p>5. The approach used for sampling within the PoA is stratified sampling. The section A.4.4.2 of PoA-DD which refers to the monitoring plan and</p>	<p>5. The PP has adopted stratified random sampling, in the Section A 4.4.2 of revised PoA-DD. This is mentioned in accordance with EB 50, Annex 13, hence, point 5 is</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
6. Point no. 6: PoA-DD doesn't describe compatibility of BGPL make CFL and 'run time meter'. What if another make CFL is used by user, is not clear for working of 'run time meter'. . Also, it is not clearly stated how PP will ensure that CFLs manufactured by them only will be used in each CPA and the end user will use no other brand after distribution of CFL. This is very much probable in case if the distributed CFL stops working and the end user procure CFL from retail market.		<p>sampling method has been revised and updated.</p> <p>6. In case the project CFL is replaced by any other CFL by the owner, it will be found out by the project proponent / third party in the following ways:</p> <p>a) The project CFLs will have the brand name of 'Zora' and 'For BGPL PoA Only' printed on them. During the distribution and installation of CFLs, the CFLs would be sealed. A random number (derived as per procedure in section A.4.42) of non-metered location would be identified and designated as non-metered samples. At the time of monitoring of these non-meters samples, if however it is observed that the seal is tampered / broken or the lamp is found to be fused or replaced with non-BGPL lamp, then it is documented and recorded for discounting of CERs.</p>	<p>closed.</p> <p>6. The PP has clearly described in the revised PoA-DD, section A.4.2.2, for temper-proof use of PP's CFL and hence, claiming for Emission Reduction. It is clarified that CFL (manufactured by PP) would be sealed during distribution. For metered and non-metered CFLs following would be adopted :</p> <p>a) The non-metered CFL of PP can be identified with brand name as "Zora' and by marking "For BGPL PoA only'. It is also clarified that, use of other brand will be identified due to different</p>



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		<p>Say, for example, if out of 100 non-metered samples, 5 are observed to be with tampered / broken seal, fused lamp or replaced with non-BGPL lamp, then $(1 - 5/100)$ or 95% is discounting factor. This factor would then be multiplied with the calculated CERs to arrive at the actual CERs for issuance.</p> <p>b) The run-time meter will be sealed to the CFL in the metered sample. It is highly unlikely that the owner will try to break the seal in case of CFL replacement and use the run time meter with the other non-project CFL. In this scenario, the run time meter reading will not be available for that particular CFL after replacement. Even if the owner is using the run time meter with a non-project CFL, it will be found out when the project proponent / third party visits the place for shifting the run time meter</p>	<p>brand name and in that case, discounting factor would be applied to emission reduction.</p> <p>b) In case of metered sample, it is clarified that, sealing mechanism would be such that if other brand is tried to use by consumer, the runtime meter would not work after CFL replacement, hence, chances of claiming of emission reduction due to different brand/manufacturer would not occur.</p> <p>The validation team finds this as appropriate; hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
7. In general, description of point no. 4, 5, 6 and 7 of section A.4.2 of SSC-POA-DD is not synchronized for overall process to be adopted by PP for baseline survey for each CPA, distribution of CFLs, collection and disposal of replaced ILs, sampling and/or survey for both implementation as well as ex post monitoring and installation of CFL with run time meters.		<p>after a period of ninety days. This will be recorded by the surveyor and the emission reductions will be reduced for that particular CFL accordingly. Similar to the above, if any non-BGPL CFLs are found in the holder, then it would be considered along with the tampered / broken seal, or fused lamp.</p> <p>7. The description of point no. 4, 5, 6 and 7 of section A.4.2 of SSC-PoA-DD has been updated. As stated the project involves Manufacturing of CFLs, raising of awareness campaign, baseline survey, distribution phase where manufacture CFLs will be distributed, monitoring phase and disposal of ILs, sampling procedure for both implementation as well as ex post monitoring and installation of CFL with runtime meters, . The information</p>	<p>7. In the section A.4.2 of revised PoA-PDD, it is mentioned in point no. (1) that CFLs will conform to the Indian Standards IS : 15111 which in turn is an adaptation of the International Electro-technical Commission (IEC) standards IEC 60968 (1988). The PP has submitted various test reports for different types of CFLs covered under this</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
8. It is stated that the energy savings of SSC-CPA will not exceed 60 GWh. This is to be demonstrated with credible supportive. Also, it is stated that POA can be implemented by Project Participant or other parties. Please clarify what role does other party play.		<p>is updated in PoA DD.</p> <p>8. As per the requirement of the methodology, for each CPA, the aggregate energy savings by a single project will not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies (Point 1 of the methodology). This can be verified in each SSC-CPA by the DOE based on the data recorded during distribution and monitoring surveys carried out for each SSC-CPA. This point has been put as an eligibility criterion for each SSC-CPA</p>	<p>PoA. The tests are carried out by Physical Research laboratory. The PP has also described sampling in the PoA-DD, validation team reviewed this, hence, this point is closed.</p> <p>8. It is clarified by the PP that, as per the requirement of the methodology, for each CPA, the aggregate energy savings by a single project will not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies (Point 1 of the methodology) This point has been put as an eligibility criterion for each SSC-CPA in the generic CPA DD and</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
9. The title of project activity mentions manufacture and installation of CFLs. However, entire description of implementation and monitoring of CPA in section B.5.2 is focused on distribution only. Please clarify.		<p>in the generic CPA DD and PoA DD. The section A.4.6 in CPA-DD has been updated and considered the scenario of 100W IL being replaced with 20W CFL, which gives maximum achievable energy saving on the wattage of bulbs. The same can be cross-checked with Gollaguda_CPA1 CER sheet.</p> <p>9. The emissions associated with consumption of power by the installed CFL/IL during its lifetime are much higher compared with the manufacturing emissions and hence were erroneously not considered in the webhosted PDD. However the same along with the emissions associated with manufacturing of</p>	<p>PoA DD. The section A.4.6 in CPA-DD has been updated by the PP and has considered the scenario of 100W IL being replaced with 20W CFL, which gives maximum achievable energy saving on the wattage of bulbs. This is demonstrated in the Estimated Emission Reduction Sheet, validation team accepts this, hence, the point is closed.</p> <p>9. The information related to monitoring for 'Manufacturing' is now added in the revised CPA-PDD, which is found appropriate, hence, this point is closed.</p> <p>All the point of CL are</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		CFLs/ILs are now considered in the revised PoA-DD.	closed, hence, CL is closed.
CL-8 Specific CPA-DD The following needs further clarity in section A.4.2.1 viz. PDD states; 1. RoHS directive for use of mercury 0.1% as mentioned in PDD. – Provide all RoHS directive applicable and procedure followed.	(3.g.i)	1. BGPL was given licence by Bureau of Indian Standards (BIS) with licence no CM/L/3302940 dated 01-02-2011 which is valid till January 2013. Therefore, BGPL would follow those guidelines to restrict use of mercury by 0.1 %. The total quantity of mercury used in CFL will be restricted to 5 mg/CFL. Each lamp would typically have 4mg of mercury amalgam pill. Hence it can be monitored that the mercury content in each CFL would be below 5mg. Hence BGPL would confirm to the compliance of RoHS. BGPL has internal Quality Assurance (QA) and Quality Control (QC) team which will continuously monitor the production process including content of Mercury. After quality check as provided by BIS specifications, each lot will be cleared and marked with ISI marked after approval by QA team. All the stages of operations of QA team are recorded, maintained and	1. The PP has clarified that the product i.e. CFL is produced as per BIS certification. Hence, use of mercury would be as per the BIS requirement. Here in the case it would be restricted to 5 mg/CFL. Since, the organization is BIS certified having license to manufacture CFLs as per Indian Standard, valid till January 2013, having reviewed this, validation team closed this point.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>2. The manufactured CFL comply IEC standard, thus also Indian standard – clarify which IEC and Indian standard is followed. Please provide evidence for the same</p> <p>3. With reference to above point, the CPA implementation and monitoring is focused</p>		<p>reviewed.</p> <p>2. The statement has been removed and restated as above (point 1). The BIS team annually draws samples at the factory and from the open market and tests it at various NABL approved laboratories. Upon satisfactory result, BIS would renew the license for manufacturing CFLs. A latest copy of license renewal is being submitted as DVR3_Annex 05_BIS.</p> <p>3. The implementation, monitoring and technology of a typical SSC-CPA has been revised to include both</p>	<p>2. The PP has corrected the statement in the revised PoA-DD. It is clarified that, samples are taken from BIS (Bureau of India Standards) and is tested at NABL approved laboratories. Based on satisfactory result, license for manufacturing CFLs is renewed. The PP has provided latest copy of license no. 3302940, renewed till February 2013, hence, this point is closed.</p> <p>3. The revised SSC CPA-PDD mentions details about 'Manufacturing and distribution of CFLs in India. The distribution is free of cost to consumers'. The project</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>only on distribution of CFL. The technology described is for manufacturing of CFL. Please clarify how manufacturing reduces GHG emissions.</p> <p>4. Please explain the relevance of working principle of CFL in this section of SSC-POA-DD.</p>		<p>manufacturing and distribution activities. The project activity is a group of activities (manufacturing and free distribution of CFLs) which eventually lead to reduction in emission reductions. In the current project activity, the project proponent has taken up manufacturing and free distribution of CFLs which leads to reduction in emission reductions on the demand side.</p> <p>4.The working principle of CFL clearly explains how a CFL requires lesser energy than an IL for the same lumen output. The CFL consumes about one-fifth of power when compared with ILs. The same has been updated in the revised PoA-DD and CPA-DD.</p>	<p>activity is combined i.e. manufacturing and distribution, which reduces emission reductions, hence this point is closed.</p> <p>4. The working principle of CFL is described in PoA-DD clearly and explanation of reduction of power consumption due to CFL to the tune of one-fifth the original power consumption is supported by "BLY_manual.pdf". This is published by the Bureau of Energy Efficiency, which is a Central Government organisation of Government of India, hence, found appropriate, hence, this</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			point is closed. Conclusion: CL – 8 is closed.
CL-9 Mandatory policy/regulation 1. It is mentioned that there are no policy and/or regulation for usage of CFLs and hence the project activity is voluntary action by Project Participant. Please explain how the voluntary participation is established for Balaji Greentech as project participant. 2. Non-applicability of “If the PoA is implementing a mandatory policy / regulation, this would/is not enforced” is not described. 3. Non-applicability of “If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation” is not described.	(3.h.i) to (3.h.iv)	1. As stated in CL-5, there is no mandate given by the Government of India, which requires BGPL to manufacture CFLs and distribute these CFLs for free of cost. Hence the project is clearly a voluntary participation on the part of BGPL. 2. The point has been updated in the revised PoA-DD. 3. The point has been updated in the revised PoA-DD. The footnotes have been revised / retained accordingly (taking reference	1. PP has replied that, there is no mandate by Government, which requires PP to manufacture and Freely distribute CFLs. Based on sectoral knowledge, DOE agrees to this, hence, this point is closed. 2. The PP has now updated the sentence “If the PoA is implementing a mandatory policy/regulation, this would/is not enforced” hence, closed this point. 3. Non-applicability of “If mandatory a policy/regulation is enforced, the PoA will lead to a greater



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<p>Also, following requires clarification:</p> <p>4. PDD mentions, "Lighting consumes about 20% of electricity" this is supported by footnote no. 4 and "India has very low usage of CFLs with a penetration factor of 4% of ILs" is supported by footnote no.5. However; Authenticity of the article/web page is not demonstrated.). Project participant needs to provide justification on use of this data to support the description of SSC-POA-DD.</p>		<p>from the registered PoA of BEE).</p> <p>The information with respect to the power sector scenario is available in Igbr_report, Annex II, Annex III. The same has been corrected and updated in PoA-DD.</p> <p>4. The statement stating "Lighting consumes about 20% of electricity" has been removed in revised PoA-DD. With respect to the power demand/supply scenario, the "Load Generation Balance Report" provided by Central Electricity Authority is provided as the reference document. The same has been provided as footnote 4 in the revised PoA-DD.</p>	<p>level of enforcement of the existing mandatory policy/regulation" is now described in the revised PoA-PDD , hence, closed.</p> <p>4. The PP has removed the statement, "Lighting consumes about 20% of electricity" hence, this point is closed.</p> <p>All the points of CL-9 are closed, hence, the CL is closed.</p>
<p>CL-10 Record keeping</p> <p>1. The record keeping of each CPA to be included in PoA is not in place. Collection, storage and standard practice / prodedure for</p>	(3.i.i) to (3.i.iv)	<p>1. Under PoA, a record with information of all the CPAs which will be registered under the PoA will be maintained. A detail record of CPA which includes the details locations,</p>	<p>1. In the revised PoA-PDD, it is mentioned that record of various data for each SSC-CPA will be maintained for the entire crediting period</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>disposal of Incandenscent Lamp is also not defined.</p> <p>2. The system / procedure described to avoid double accounting is not defined in section A.4.4.1. (ii) of PDD-PoA.</p>		<p>the details of the consumers to whom the CFLs have been distributed will be maintained.</p> <p>The statement has been rephrased as "Archiving Procedure" in the revised PoA documents.</p> <p>The section A.4.4.1 of PoA-DD has been revised and updated. A detailed template of information which would be collected during the baseline survey and distribution survey is updated and provided.</p> <p>2. The system / procedure described to avoid double accounting is defined in section A.4.4.1. (ii) of PDD. In order to avoid double counting, a project boundary of SSC-CPA under the current PoA will be checked with the project boundary(ies) of all the other CDM projects and CPAs of other</p>	<p>plus additional two years for a SSC-CPA. The same is described in the 'archiving' procedure in the revised PoA-DD. A template of information which would be collected during the baseline survey and distribution survey is now clearly mentioned in the revised PoA-DD, section A.4.4.1, hence, this point is closed.</p> <p>2. The system / procedure described to avoid double accounting is clearly defined in section A.4.4.1.(ii) of PDD-PoA. This is found appropriate by the validation team. In order to avoid double accounting, hence, this point is closed.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>PoAs, which use the same measure of replacing ILs with CFLs and which are available with the UNFCCC. In case the SSC-CPA region overlaps with any other CPA or CDM region, the project proponent will review whether the places identified for distribution are included within both CPAs/CDM project activities. The project proponent may decide not to go ahead with the SSC-CPA's inclusion in PoA based on the review outcome. In cases where there is an overlap of the CPA region, a check would also be done and houses (or any other commercial place) where the CFLs have been distributed as a part of another CDM project activity or as a CPA of another PoA, the corresponding places will be identified through their electricity meter numbers and will be avoided in the SSC-CPA of the current PoA. This would ensure that there would be no double</p>	



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>counting of emission reductions. Moreover in accordance with the "General Guidelines to SSC CDM methodologies" Version 17, the project boundary will be limited to the physical project activity.</p> <p>During the distribution of CFLs under the programme, the household/office/shop owner would be required to sign an undertaking stating that he/she would not claim CDM benefits for the distributed CFLs. This is particularly significant for large townships, green buildings which plan to use energy efficient lighting devices. These buildings which use CFLs distributed as part of this programme would not be eligible to claim benefits for the same.</p> <p>3. BGPL may spread awareness about CFLs and their programme to</p>	<p>3. It is clarified in the revised PoA-PDD, that BGPL may</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>3. The PP has decided to spread the awareness for the use of CFL over the conventional IL within the region, through third party agency. However, structure / qualification of personels of third party agency is not clearly mentioned.</p> <p>4. Also clarify for following :The PDD states “ the project proponent will identify an area within India for distribution of CFLs that is manufactured in its facility at Nandikandi village, Andhra Pradesh or any other facility. Pl. clarify location of “other facility” ?</p>		<p>distribute CFLs free of cost through different media like print media (pamphlets, newspapers, posters), television, radio etc. They may not hire a third party agency to spread awareness. This has been explained in revised PoA-DD.</p> <p>4. The PoA documents have been revised to remove the other facilities from the documents.</p>	<p>spread awareness about CFLs and their programme to distribute CFLs free of cost through different media like print media (pamphlets, newspapers, posters), television, radio etc. – hence, this point is closed.</p> <p>4. The revised PoA-PDD version 2 is corrected and ‘other facility’ for manufacturing is now removed.</p> <p>All the points of CL are closed, hence, CL-10 is closed.</p>
<p>CL-11 Start date Starting date of PoA is written as 16/04/2008. However, provide the copy of all the contracts / PO / Work Orders signed for this project.</p>	(3.1)	<p>The purchase order corresponding to the start date of the PoA has already been submitted prior to the receipt of DVR (as Annex 9 in courier dated 30/06/2010).</p>	<p>PP has submitted Purchase order in order to demonstrate the start date of the PoA. The same is issued to M/s. Precision Engineering Works, Hyderabad,</p>



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			<p>vide no. BGL/002/08-09 dtd. 16-04-2008 "Design, Engineering, manufacturing and supply of machines and appliance having individual functions as per our Designs"</p> <p>The CPA start date clarified in the CPA-DD is 01/07/2012, i.e. when actual distribution of CFL would take place, hence, CL-11 is closed.</p>
CL-12 Length of PoA The length of the POA has not been provided in years only and not in months.	(3.m)	The statement has been updated in the revised PoA-DD.	The length of the PoA is mentioned as 28 year 00 months in the revised PoA-PDD, in section B.2 of th PoA-DD, hence, CL is closed.
CL-13 Hazard Analysis & Risk Assessment Provide the copy of evidences of Hazard Analysis Risk Assessment study conducted as mentioned in PDD.	(3.o)	A copy of Hazard Analysis Risk Assessment study conducted has already been submitted prior to the receipt of DVR (as Annex 2 in courier dated 30/06/2010). All the necessary actions/implementations or suggestion made by M/s. Surya has been	The PP has submitted A copy of "Hazard Analysis Risk Assessment" study conducted by third party M/s. Surya System Safety Services Pvt. Ltd., Secundarabad in year 2008. The compliance of the same has been



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		implemented. A copy of compliance of HARA is provided as DVR2_Annex 01	submitted vide document no. "DVR2_Annex 01 as Annex 2", having reviewed this, the validation team finds this as appropriate, hence CL is closed.
CL-14 CPA DD Clarification for the energy saving value 0.022 Gwh, as mentioned in section A.4.6 of specific CPA PDD is based on replacement of 60w IL bulb and not on replacement of maximum wattage bulb i.e. 100w.	(3.t)	Among the three wattages considered currently for calculation (as calculated in CPA-CER sheet), the replacement of 100W IL with 20W CFL would result in maximum energy saving of 0.00011 GWh per lamp, which is lower than threshold value specified in de-bundling guideline (i.e., 1% of the small scale threshold of 60 GWh / annum is 0.6 GWh per annum)	In the section B.2, revised CPA-PDD version 2, it is demonstrated that the energy saving in Gollaguda CPA would be less than 0.60 GWh/annum, which is the threshold value for de-bundling guideline, hence, CL is closed
CL-15 PoA-DD National polciies Description of national policies and circumstances relevant to the baseline of the proposed Project Activity is not stated in the PoA-PDD.	(3.w.iv)	The description regarding the national policies relevant to the baseline has already been explained in the section A.4.3 of PoA-DD.	The description regarding national policies relevant to the baseline has been explained in the section A.4.3 of PoA-PDD, hence, CL is closed.
CL-16 Methodological Choices Description of methodological choice is not provided in accordance with requirement of CDM.	(3.x.i)	In the calculation of the baseline and project emissions, if any recent data is available for the grid in the SSC-CPA region for technical losses in the grid, the	It is mentioned in the revised PoA-PDD version 2 that "In the calculation of the baseline and project emissions, as there is no



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		same would be used. Typically all the state transmission and distribution companies (eg., APTRANSCO in Andhra Pradesh) provide periodic transmission losses prevailing in the respective State/DISCOM region. However in the absence of such data during verification stage, default value of 0.1 would be used for actual CER calculation. However the statement stating the default value has been removed from the section of E.6.f of PoA-DD.	recent data available on the technical losses in the grid, the project proponent intends to use the default value of 0.1." It is also mentioned that, PP would use authentic data published by the respective state/DISCOM in the region. However, since latest data is not available, validation team finds this appropriate in line with methodology requirement, hence, CL-16 is closed.
CL-17 Algorithm The algorithms to calculate the baseline emissions, emission reductions, project emissions and leakage are provided. However, following points needs clarification : 1. why value of $l_y = 0.1$ (average annual technical grid loss) is used is not clearly explained.	(3.x.ii)	1. In the calculation of the baseline and project emissions, if any recent data is available for the grid in the SSC-CPA region for technical losses in the grid, the same would be used. In the absence of availability of such data, the project proponent intends to use the default value of 0.1. The sources could include the data available with regulatory bodies such as electricity boards, transmission and distribution bodies etc. Typically all the state	1. Project Participant has provided justification for use of value of average annual technical grid loss = 0.1. This mentions that, since data is not available at his moment for transmission loss, the default value as 0.1 is used as per methodology. However, if any recent data is available for the grid in the SSC-CPA the same would be



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
2. The baseline and project emission calculation approach does not include details of emissions on account of CFL manufacturing activity irrespective of location of manufacturing.		<p>transmission and distribution companies (eg., APTRANSCO in Andhra Pradesh) provide periodic transmission losses prevailing in the respective State/DISCOM region. However in the absence of such data during verification stage, default value of 0.1 would be used for actual CER calculation.</p> <p>2. The usage of DG set and consideration of same has already been included in the PoA-DD. In the absence of any power failure during the manufacturing process, the project proponent will be using DG set. The usage of the DG set in project and baseline scenario would typically depend on the outages of power. For the ex-ante calculations it is assumed that the there are no power outages,</p>	<p>used. The validation team finds this as appropriate, hence, point 1 is closed.</p> <p>2. The PP in the revised PoA-DD section E.6.1 has considered emission due to manufacturing activities, where use of DG set is done. It is assumed that, there is no diesel used, while estimating emission reduction, however, provision for accounting emission due to diesel is described in PoA-DD section E.6.1, hence, this point is closed.</p>



VALIDATION REPORT



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
3. Latest version of CEA database is not referred.		and hence the diesel consumption has been considered as zero. The same has been considered for calculations. 3. The latest available version at the time of submission of documents to validator i.e. CEA database version 5 has already been referred.	3. The PP has referred Latest version of CEA data base 5 available at the time of submission of documents (for grid emission factor) to DOE is used, hence, this point is closed. All the points of CL are closed, hence, the CL-17 is closed.
CL-18 Clarification is required for following points in section E.6.3: 1. Data unit not mentioned in 1 st , 2 nd and 5 th parameter. 2. Source of data is mentioned as Distribution data. Please clarify exactly what kind of source it is.	(3.x.iii)	1. The data units for all the parameters have been updated in the section E.6.3. 2. All the source of data is mentioned	1. The data units for all the parameters are now mentioned in PoA-DD section E.6.3, hence point 1 is closed. 2. The PP has now revised the source(s) of all the data, hence, this point is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
3. CEA database version 5 is applied. In earlier section it is indicated as version 4. Please clarify.		correctly in revised PDD 3. The version available at the time of PoADD webhosting is 4, hence, the same is used.	3. The PP has used the CEA database version available at the time of web hosting, which is correct, hence, closed this point. The CL is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CL-19 Date of completion of application of methodology is 25/01/2010 whereas date of PDD is 10/12/2008. Please clarify.	(3.z.i)	The date of completion of document is updated in the revised PoA documents.	In the revised PoA-PDD section E.8, date of completion of application of methodology is mentioned as 25/01/2010 and date of PoA-DD is 14/04/2012, hence, the CL is closed.
CL-20 Specific CPA-DD The pre-project scenario is not described transparently in section A.2 of specific PDD. E.g. following points are not clearly described in PDD. <ol style="list-style-type: none"> 1. It is stated that for a given lumen output, CFLs consume up to one-fourth (approx.) of power of an equivalent ILs causing reduction in requirement of electricity from the connected electricity grid, which predominantly uses fossil fuel for electricity generation. However, reduction in energy consumption is not demonstrated transparently. 	(4.b)	<ol style="list-style-type: none"> 1. As per the requirement of the methodology, the lumen output of the ILs and CFLs have been compared. For a lumen output of similar range, CFLs consume lesser wattage of power compared to ILs. All the relevant lumen output of CFLs and ILs has been provided in revised PoA-DD. However, in order to calculate the savings in energy usage the actual wattage of the CFLs and ILs has been used. For a similar lumen output, as stated in Bhachat Lamp Yojana (a programme initiated by BEE, Government of India) CFLs would consume approximately one-fifth of power compared to the ILs. The 	<ol style="list-style-type: none"> 1 The PP has described how energy consumption is reduced due to use of CFL (i.e. Project activity). The same is supported with the data source from IS 418 and from the Bachat Lamp Yojna. Since this is a document from Govt. Of India, validation team accepts the fact that by the use of project equipment, there would be saving in energy consumption, hence, this point is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>2. PDD mentions – “BGPL will carry out series of activities leading to distribution of CFLs in selected areas in India”. The areas planned for distribution by project participant are not clearly mentioned in PDD.</p> <p>3. It is mentioned in economic well being that the distributed CFL would consume less</p>		<p>lumen output has been considered as per IS 418:2004. The same has been updated in the CPA-DD. It is evident that for a given lumen output, CFLs would consume lesser electricity than the ILs. Hence usage of CFLs over ILs would reduce electricity bills for the end users. Hence the same statement has been retained.</p> <p>2. The region identified for the CPA can be a stand alone or combination of villages, localities, townships, commercial spaces, districts etc. The CPA region would be identified such that the total energy saving occurring because of the CPA activity will be within the limits of small scale project activity i.e., 60GWh.</p> <p>3. For the same light output, the</p>	<p>2. It is clarified by the PP that, the region can be a village or combination of villages, localities, townships, commercial spaces, districts et. However, emission reduction should not increase 60 GWh in particular CPA, this is in line with methodology, hence, this point is closed.</p> <p>3. The PP has clarified that,</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>power compared to the IL, thus reducing the electricity bills of consumers covered under the project activity. Provide evidence for reduction in electricity bill of consumers.</p> <p>4. The table in section A-2 show no. of lighting devices and total penetration rate of 9% CFL does not match. Provide complete details to demonstrate that there is a penetration level of energy efficient CFL as 9%.</p>		<p>wattages required for the CFL in comparison to IL is less. This is evident from the BLY website as mentioned earlier.</p> <p>4. The table has been updated based on the revised baseline survey.</p>	<p>for a given lumen output, CFLs would consume lesser electricity than ILs. Hence, usage of CFLs over ILs for the same amount of light output would reduce electricity bills for the same hours usage. Validation team agrees to this, hence, this point is closed.</p> <p>4. Validation team reviewed the website which clarifies that energy consumption is one fifth in the CFL to IL, This is supported by the weblink of Bachat Lamp Yojna of Bureau of Energy Efficiency, (http://www.bee-india.nic.in/bly/BLY_manual.pdf) which is a Central Government organization of India, hence found this</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			<p>source as appropriate, this point is closed. The penetration ratio is corrected as 8.3% in the CPA-DD, which is found correct, hence, this point is closed.</p> <p>CL-20 is closed.</p>
<p>CL-21</p> <p>The starting date of CDM/PoA project activity is mentioned in PoA DD is 16/04/2008; start date of specific CPA is from July 2010, which is related with distribution activity of CFL. However, it is not described and related with real action of a project activity that has begun. (EB33, Para 76/CDM/POA Glossary of terms/EB41, Para 67)</p>	(4.f.i)	<p>The start date of the PoA corresponds to the date on which the major financial commitment has been made for the project, which is 16/04/2008 (date of purchase order).</p> <p>The start date of the CPA corresponds to the date on which major financial commitment has been made for the respective CPA. This could correspond to the initiation of distribution of CFLs in the respective CPA. For the current CPA, the start date of the CPA is the date on which the project has started distributing the CFLs in the identified region.</p>	<p>The start date of PoA is mentioned as 16/04/2008, which is a purchase order date for the machineries used for manufacturing, i.e. real action for PoA.</p> <p>For the first CPA, it is now mentioned in the revised CPA that the start date of the specific CPA would correspond to the date on which the CPA implementer intends to distribute the CFLs, which corresponds to the real action taken by the CPA implementer for that particular</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion						
		<p>The start of the validation process for the CDM-PoA-DD is 10 April 2010. Since the distribution of the CFLs are yet happen, it can be said that the project is as per the requirement of EB 55 Annex 38.</p> <table><tr><td>Start date of PoA</td><td>16/04/2008</td></tr><tr><td>Validation start date of PoA</td><td>10/04/2010</td></tr><tr><td>Start date of first CPA</td><td>01/07/2012</td></tr></table>	Start date of PoA	16/04/2008	Validation start date of PoA	10/04/2010	Start date of first CPA	01/07/2012	<p>CPA, Accordingly start date for CPA is mentioned as 1- July- 2012 (after the expected registration of PoA with UNFCCC), hence, CL-21 is closed.</p>
Start date of PoA	16/04/2008								
Validation start date of PoA	10/04/2010								
Start date of first CPA	01/07/2012								



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CL-22 The operational lifetime of CDM – PoA is 28 years and specific CPA is 10 years as mentioned. This is not mentioned in line with requirement of PDD.	(4.g)	<p>The length of PoA is 28 years (from the date of commissioning of the CFL plant or date of registration of PoA with UNFCCC, whichever is later) and the length of CPAs would be 10 years (from the end date of distribution of CFLs or the date of registration of SSC-CPA under the registered PoA, whichever is later).</p> <p>The start date of the crediting period has been considered to be the date of completion of distribution activity of CFLs in SSC-CPA under SSC-PoA or the date on which the CPA-DD gets added under the registered PoA, whichever is later. The end date of the crediting period would correspond to either 10 years from the beginning of crediting period or end of life of the CLF, whichever is earlier. CFLs, to be distributed in each CPA are expected to have at least 6000 hours of operation.</p>	It is clarified by the PP that, the start date of the crediting period considered is the date of completion of distribution activity of CFLs in SSC-CPA under SSC-PoA or the date on which the CPA-DD gets added under the registered PoA, whichever is later, the same would be demonstrated through documentary evidences as clarified in CPA DD. The end date of the crediting period would correspond to either 10 years from the beginning of crediting period or end of life of the CLF, whichever is earlier. CFLs, to be distributed in each CPA are expected to have at least 6000 hours of operation. Based on the corrections in the revised CPA DD the CL-22 is closed.
CL-23 CPA-DD The date in Section A.4.3 of Specific DD is not	(4.i)	The statement has been revised and	In the CPA-DD, section A.4.3, it



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
described in the required format.		updated in revised CPA-DD and revised generic CPA-DD.	is clarified that, the expected date of CFL distribution is 01/01/2012. Hence, the start date of the crediting period has been considered to be the date of completion of distribution activity of CFLs in SSC-CPA under SSC-PoA, or the date on which the CPA-DD gets added under the registered PoA, whichever is later. This is correct, hence, CL-23 is closed.
<u>CL-24 CPA-DD</u> The information is provided on the de-bundling aspect. However, while demonstrating that specific CPA satisfies the condition of 1% of the small-scale threshold of 60 Gwh/annum, CFL bulb wattage considered for calculation is not for maximum wattage of CFL, which is to be used in the project activity. Please clarify.	(4.n)	The debundling check has been done based on the highest wattage of replaced IL, i.e., 100 W IL being replace 26 w . The calculations are provided in column M in worksheet of 'Total CERs' in Gollaguda_CPA1 CER sheet.	The de-bundling check have been done by PP on the highest wattage of replaced (100 W IL replaced with 26 W CFL). Having reviewed the same in the "Gollaguda CPA1 CER sheet" validation team finds it appropriate, hence, CL-24 is closed
<u>CL-25 Eligibility criteria</u> In eligible criteria no. 3 of section B.2, it is not	(4.q)	The statement has been rephrased. As stated above, the BIS team would	The procedure for meeting with BIS and IEC standards are



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
explained clearly how specific CPA will meet BIS and IEC standards as required by the criteria.		periodically draw samples at the factory and from the open market and test it at various NABL approved laboratories. Upon satisfactory result, BIS would then renew the license for manufacturing CFLs. The license number issued for the BGPL manufacturing plant is 3302940.	explained by the PP. Also, license to manufacture CFL issued from BIS is provided as support (License no. 3302940 valid till February 2013). Having reviewed this, validation team finds this appropriate, hence, CL-25 is closed.
CL-26 Manufacturing activity emissions The POA is manufacture and distribution of CFL in India, it is not clearly mentioned why manufacturing activity emissions are neglected/not considered as project emissions.	(4.v)	As mentioned in response to CAR 7, the baseline and project emissions are revised in the documents. Combustion of Propane during manufacturing of CFLs would result in emission of CO ₂ and does not result in emission of methane (CH ₄). Hence the same is excluded in section E.3. The usage of propane and diesel has been added in section E.3 of revised PoA-DD.	The PP has now considered emissions due to manufacturing activity, the same is evident in section E.3, also it clarified that, due to use of Propane there would be emission of CO ₂ , which is now considered, hence, CL-26 is closed.
CL-27 PoA-DD and CPA DD The project description in the PDD does not state the essential differences resulting in the project activity scenario vis-à-vis the pre-project situation.	(5.k)	The description in section A.2 of PoA-DD states essential differences resulting by the project activity.	The description in section A.2, in the revised PoA-DD and CPA-DD clearly mentions the essential difference resulting by the project activity vis-à-vis the pre-project



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			situation, hence CL-27 is closed.
CL-28 The PDD does not describe in details how and why reduction in use of fossil fuel is there due to project activity and how environmentally safe and sound technology and know-how is being applied.	(5.l)	The section has been rephrased in the revised PoA-DD. Moreover, the HARA report for the project activity concerning the environmental issues related to the project activity has already been provided to DOE for reference.	The PP corrected the PoA DD. In the section A.2, it is mentioned that "decrease in the usage of grid power reduces the usage of fossil fuels and greenhouse gas emissions associated with the electricity grid" which is appropriate, hence, CL-28 is closed.
CL-29 All relevant national policies and guidelines appropriate to the Project Activity have not been discussed clearly in the PoA-DD. Clarify them further.	(6.d.l)	As stated in response to CL-5 and CL-9, all the relevant national policies and guidelines appropriate to the project activity have already been discussed in PoA-DD.	In the revised PoA-PDD version 2, section A.4.3, the revision related to National policies and guidelines is corrected, hence, CL-29 is closed.
CL-30 The justification for why the date indicated in Section B.1 of the POA DD is considered as the start date of the project activity is not mentioned.	(7.a.c)	The section B.1 is rephrased in the revised PoA-DD.	It is clarified in the revised PoA-PDD version 2 that "The start date of the project activity which corresponds to the real action taken by the project proponent is the purchase order placed for



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
			CFL manufacturing facility, which is 16/04/2008", this is first real action as per Glossary of CDM, hence, CL-30 is closed.
<p>CL-31</p> <p>The PoA-DD, section E.4 in the investment analysis describes that apart from CDM revenue, there will be income of Rs. 15/- for each CFL which is replaced in lieu of IL bulbs. With this income also, it is demonstrated that the project is financially not viable.</p> <p>However, during site visit of the validation team, it was discussed that BGPL has a planning of selling CFL tubes to the retail market in case of surplus production capacity and also to the bulk consumer/customer. Income of this is not considered in financial investment and also not described in the PDD.</p> <p>Also, it was discussed that PP has a planning to purchase CFLs from other manufacturer and distribute the same under PoA. This is not considered investment analysis and also not</p>	(7.c.c.i)	<p>At the project conceptualisation stage, the project proponent planned to seek INR 15 per CFL under its program. The project activity is additional even with these revenues for CFLs. However, the project proponent plans to distribute the CFLs free of cost. The investment analysis done in PoA documents has been revised as follows:</p> <p>At the project conceptualisation stage, the project proponent planned to seek INR 15 per CFL under its program. The project activity is additional while considering these revenues for CFLs. However, in its board meeting dated 22 June 2009, the board has re-assessed the financial viability and has decided to distribute the manufactured CFLs for free of cost</p>	<p>It is clarified that the PP has taken decision to sale the CFL at a cost of INR 15 per CFL at the time of decision taken i .e. on 20/03/2008. Further to this, vide its board decision dated 22/06/2009, PP decided to distribute CFLs 'free of cost'. However, to meet with the operating expenses, the board decided that it will sale single tube CFL at INR 30 and double tube CFL at INR 50. However, for this 'sold' CFLs, PP will not claim "Emission Reduction under Programme" but while calculating additionality, the revenue has been considered as cash inflow while calculating IRR. The PP has demonstrated additionality at</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
described in PDD.		<p>through the programme. In order to meet the operating expenses, the board also has decided to sell some percentage of CFLs in the retail market at 30 Rs for single lamp and 50 Rs for double lamp. Hence additionality has been re-worked with these assumptions.</p> <p>The investment comparison analysis is now done in PoA documents. The additionality has been carried out only at PoA level. The IRR has been used as the financial indicator. As the project mainly involves two separate decision made (ie., two board decisions), the financial additionality has been shown at project conceptualisation stage and at the board decision dated 22 June 2009. The revenue from the sale of CFLs in the open market (at 30 Rs for single lamp and 50 Rs for the double lamp) has been considered in the revised financial calculation sheet. It is clear from the financial analysis that even in the most</p>	<p>PoA level only. This is acceptable as per EB 60, Annex 26 guidance.</p> <p>The PP has adopted the investment comparison analysis to demonstrate additionality, as in the baseline there is only one choice, which is IL, hence, this is appropriate as per EB 62, Annex 5. Based on the clarification from the PP and after reviewing the financial calculation approach, and after removal made in PoA-DD for 'buying CFLs from other manufacturer' validation team has closed the CL-31.</p>



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>conservative scenario of sale of 100% CFLs in the open market (in which case BGPL would not claim any CERs), the project is additional when compared with the manufacturing and selling of ILs in the open market.</p> <p>It can be seen that in both the cases, the project is additional.</p> <p>The project proponent intends to distribute 100% of the energy efficient CFLs manufactured at its facility for free of cost through the current PoA program. The same was considered during conceptualization of the project activity. However in case the entire capacity of CFLs manufactured at BGPL facility cannot be routed through PoA, a fraction of these manufactured CFLs could be distributed through the retail market. Only the CFLs distributed through the programme would be considered for the calculation of CERs and hence the</p>	



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>revenues & costs taken for this fraction of CFLs to determine the additionality. The investment analysis has been revised accordingly in PoA documents.</p> <p>The PoA documents are revised to remove the inclusion of 'other manufacturers' in the PoA.</p>	
<p>CL-32</p> <p>The financial analysis submitted by the project participant does not includes sources of all the input values for the validation. Also, the project participant has not submitted all the documents related to assumptions made for financial calculations.</p>	(7.c.d)	The sources for all the financial assumption has been made is clearly provided in the updated financial documents.	In the financial spreadsheet, PP has provided sources for all the assumptions. The validation team has checked the same, and found appropriate, hence, CL-32 is closed.
<p>CL-33</p> <p>The sensitivity analysis is carried out. However, the production of the CFL is not subjected to sensitivity analysis. Please explain. Also, the spreadsheets submitted to validation team does not include sensitivity analysis.</p>	(7.c.h)	The sensitivity analysis has been corrected and updated. The formulae and the links have been provided in the revised spreadsheets.	The spreadsheet for the financial calculations now contains sensitivity analysis, on the 1) production of bulbs 2) Actual project cost and 3) Raw material price, validation team finds this as appropriate, hence, closed the CL-33.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CL-34 It is not clear as how barriers as described in PoA-DD are real and prohibitive to implementation of project activity. Please explain in detail how CDM revenue will help overcome these barriers identified in barrier analysis of section E.4 of POA-DD.	(7.d.d.i)	The barrier analysis and common practice analysis for the PoA project has been removed in the updated PoA documents.	The PP has corrected the PoA-DD and has removed barrier analysis and common practice. Since, this is small Scale PoA activity, hence, other barrier analysis and common practice analysis are not required to be demonstrated, and hence, CL-34 is closed.

As reported in section 3.6.3 above, the baseline scenario of the project scenario involves manufacture and sale of ILs (distribution) and though not provided in the methodology, the validation team is of the opinion that the baseline emissions, project emissions and leakage emissions with respect to the manufacturing activity of the IL should be considered while calculating emission reduction. This will be compared with the respective emissions of the manufacturing activity of CFLs i.e. project. Hence, the PP has provided the equations which are appropriate for calculating the GHG emissions due to manufacture of IL and CFLs. The validation of these algorithms is described as under.

The manufacturing activity of ILs leads to the GHG emission by use of Grid electricity, diesel and propane. In addition, baseline emissions also involve use of ILs, which is also accounted hereunder in accordance with methodology. Thus, total baseline emissions consist of:

Power consumption (use of grid electricity) in manufacturing process of ILs

Consumption of Propane in manufacturing of ILs

Consumption of Diesel in manufacturing of ILs

Grid electricity consumption by the end users due to ILs.

Emissions due to power consumption in manufacturing process of ILs:

$$BE_{IL,gridelec} = IE_{IL} * EF_{CO_2,ELEC,y}$$

where

$BE_{IL,gridelec}$ = Baseline emissions due to import of grid electricity for manufacturing one IL, tCO₂/yr

IE_{IL} = Electricity imported from grid for manufacturing of one IL, kWh,

= 0.207 kWh per lamp (Source: Pre-feasibility report by M/s. Nagabhushan & Co. For the Incandescent bulbs page no.24 (Ref /14/))

$EF_{CO_2,ELEC,y}$ = Emission factor in year y calculated according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1 using the CEA emission data (version 4.0) (Ref /17/)

= 0.8557 (for the southern grid)

= 0.8031 (for the NEWNE grid)

Emissions due to consumption of propane used as fuel: The usage of propane as a fuel in the manufacturing process of ILs will lead to CO₂ emissions.

$$BE_{IL,propane} = Q_{IL,propane} * EF_{propane}$$

Where,

$BE_{IL,propane}$	=	Baseline emissions due to use of propane for manufacturing one IL, tCO_2/yr
$Q_{IL,propane}$	=	Quantity of propane used for manufacturing one IL, $t_{C_3H_8}$
	=	0.015 kg of propane per lamp (Source: Pre-feasibility report by M/s. Nagabhushan & Co. For the Incandescent bulbs page no.24 (Ref /14/))
$EF_{propane}$	=	Emission factor of propane, $t_{CO_2}/t_{C_3H_8}$. The emission factor of propane considered is 3. (1 mole of propane when combusted emits 3 moles of CO_2 . Hence, as the molecular weights of propane and Carbon Dioxide are same, 1kg of propane when combusted will emit 3 kg of CO_2 .)
	=	3

Emissions due to use of diesel generator (DG) set:

$$BE_{IL,diesel} = Q_{IL,diesel} * \eta_{diesel} * NCV_{diesel} * EF_{diesel}$$

Where,

$BE_{IL,diesel}$	=	Baseline emissions due to use of DG set in IL manufacturing unit, tCO_2/yr
$Q_{IL,diesel}$	=	Quantity of diesel used in DG set in litre (Source: Prefeasibility report by M/s. Nagabhushan & Co. For the Incandescent bulbs page no.24 (Ref /14/)) (Refer explanation further given for diesel consumption in baseline and in project in this section)
η_{diesel}	=	Density of diesel, $kg/l = 0.83 \text{ kg/l}$ (Source: CEA website data (Ref /16/))
NCV_{diesel}	=	Net calorific value of diesel, $kcal/kg$
	=	43 $kcal/kg$ (Source: CEA website data (Ref /16/))
EF_{diesel}	=	74.1 tCO_2/TJ (Source: CEA website data (Ref /16/))

Total baseline emissions due to manufacturing and distribution (sale) of ILs:[b1]

$$BE_{y, total} = BE_y + \sum_i n_i \times (BE_{IL,gridelect} + BE_{IL,propane} + BE_{IL,diesel})$$

The baseline consumption of electricity by ILs and the emission factor of the grid:

$$BE_y = E_{BL,y} * EF_{CO_2ELEC,y} \quad \text{From the Equation (1) of the methodology}$$

Where,

BE_y	=	Baseline emissions in year y (tCO_2e)
$E_{BL,y}$	=	Energy consumption in the baseline year y (kWh)
$EF_{CO_2,ELEC,y}$	=	Emission factor in year y calculated according

to the “Tool to calculate the emission factor for an electricity system” version 02.2.1 using the CEA emission data (version 4.0) (Ref /17/)

= 0.8557 (for the southern grid)

= 0.8031 (for the NEWNE grid)

The energy consumption in the baseline year can be calculated as follows:

$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y) \dots\dots$ Equation (2) of the methodology

Where,

\sum_i = Sum over the group of “i” bulbs (e.g. 40W, 60W ILs) replaced or avoided by usage of CFL which is operating during the year implemented as part of the project activity

n_i = Number of ILs in each group “i” (e.g. 40W IL) replaced or avoided by installing CFLs (From the baseline data of CPA (Ref /18/))

p_i = Power of the ILs of the group of “i” (e.g. 40W IL). (From the baseline data of CPA (Ref /18/))

o_i = Average annual operating hours of the ILs of the group of “i” (From the baseline data of CPA (Ref /18/ for baseline data)).

l_y = Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction.
= 0.1 (default)

[In the calculation of the baseline and project emissions during the crediting period, if any recent data is available for the grid in the SSC-CPA region for technical losses in the grid, the same would be used. In the absence of availability of such data, the project participant intends to use the default value of 0.1.]

The manufacturing activity of CFLs (i.e. project activity) leads to the GHG emission by use of Grid electricity, diesel, and propane. In addition, project activity emission also involves use of CFLs, which is also accounted hereunder in accordance with methodology. Thus, total project emissions consist of:

Power consumption (use of grid electricity) in manufacturing process of ILs
Consumption of Propane in manufacturing of ILs

Consumption of Diesel in manufacturing of ILs
Grid electricity consumption by the end users due to ILs.

Emissions due to power consumption in manufacturing process of ILs:

$$BE_{CFL,gridelec} = IE_{CFL} * EF_{CO_2,ELEC,y}$$

Where,

- $BE_{CFL,gridelec}$ = Baseline emissions due to import of grid electricity for manufacturing one CFL, tCO₂/yr
- IE_{CFL} = Electricity imported from grid for manufacturing of one CFL, kWh
= 0.547 kWh per lamp from TEVR report (Ref /15/)
- $EF_{CO_2,ELEC,y}$ = Emission factor in year y calculated according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1 using the CEA emission data (version 4.0) (Ref /17/)
= 0.8557 (for the southern grid)
= 0.8031 (for the NEWNE grid)

Emissions due to consumption of propane used as fuel: The usage of propane as a fuel in the manufacturing process of CFLs will lead to CO₂ emissions.

$$BE_{CFL,propane} = Q_{CFL,propane} * EF_{propane}$$

Where,

- $BE_{CFL,propane}$ = Baseline emissions due to use of propane for manufacturing one CFL, tCO₂/yr
- $Q_{CFL,propane}$ = Quantity of propane used for manufacturing one IL, tC₃H₈
= 0.063 kg of propane per lamp (Source: Pre-feasibility report by M/s. Nagabhushan & Co. For the CFL, page no.24 (Ref /15/))
- $EF_{propane}$ = Emission factor of propane, tCO₂/tC₃H₈. The emission factor of propane considered is 3. Since, (1 mole of propane when combusted emits 3 moles of CO₂. Hence, as the molecular weights of propane and Carbon Dioxide are same, 1kg of propane when combusted will emit 3 kg of CO₂.)
= 3

Emissions due to use of diesel generator (DG) set:

$$BE_{CFL,diesel} = Q_{CFL,diesel} * \eta_{diesel} * NCV_{diesel} * EF_{diesel}$$

Where,

- $BE_{CFL,diesel}$ = Baseline emissions due to use of DG set in CFL

	manufacturing unit, tCO ₂ /yr
$Q_{CFL,diesel}$	= Quantity of diesel used in DG set in litre (Source: Techno Economic Viability report by M/s. Nagabhushan & Co. For the CFL page no.24 (Ref /15/))
η_{diesel}	= Density of diesel, kg/l = 0.83 kg/l (Source: from CEA database (Ref /16/))
NCV_{diesel}	= Net calorific value of diesel, kcal/kg = 43 kcal/kg (Source: from CEA database (Ref /16/))
EF_{diesel}	= 74.1 tCO ₂ /TJ (Source: from CEA database (Ref /16/))

As the DG set usage can be considered same due to use in exigencies both in the baseline and project scenario, the emissions due to operation of DG set can be ruled out from the calculations.