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Validation Report

Osram GmbH

VALIDATION OF THE CDM-PROJECT:

Visakhapatnam (India) OSRAM CFL distribution CDM Project

REPORT NO. 1066680

10 February 2009

TÜV SÜD Industrie Service GmbH

Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

Report No.	Date of first issue	Revision No.	Date of this revision	Certificate No.
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Subject: Validation of a CDM Project

Accredited TÜV SÜD Unit:	**TÜV SÜD Contract Partner:**
TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 - 80686 Munich Federal Republic of Germany	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany
Client: Osram GmbH Hellabrunner Str. 1 81543 Munich Federal Republic of Germany	**Project Site(s):** Visakhapatnam, Andhra Pradesh, India

Project Title: Visakhapatnam (India) OSRAM CFL distribution CDM Project

Applied Methodology / Version: AMS II.C, version 9	**Scope(s):** 3

First PDD Version:		**Final PDD version:**	
Date of issuance:	23-08-2007	Date of issuance:	03-02-2009
Version No.:	1	Version No.:	06
Starting Date of GSP	28-08-2007		

Estimated Annual Emission Reduction: 27,427 tons CO_2e

Assessment Team Leader:	**Further Assessment Team Members:**
Abhishek Goyal Bratin Roy	Sergio Degener Praveen Pyata Sandeep Kanda

Summary of the Validation Opinion:

☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfillment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board in case letters of approval of all Parties involved will be available before the expiring date of the applied methodology (ies) or the applied methodology version respectively.

☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfillment of all stated criteria. Hence TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board on this decision.

Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority, India
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
GHG	Greenhouse gas(es)
GLS	Tungsten filament incandescent lamps for general lighting service
PP	Project Proponent
KP	Kyoto Protocol
NGO	Non Governmental Organisation
PDD	Project Design Document
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The validation objective is an independent assessment by a Third Party (Designated Operational Entity = DOE) of a proposed project activity against all defined criteria set for the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and will finally result in a conclusion by the executing DOE whether a project activity is valid and should be submitted for registration to the CDM-EB. The ultimate decision on the registration of a proposed project activity rests at the CDM Executive Board and the Parties involved.

The project activity discussed by this validation report has been submitted under the project title:

Visakhapatnam (India) OSRAM CFL distribution CDM Project

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities the scope is set by:

- The Kyoto Protocol, in particular § 12
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions by the EB published under http://cdm.unfccc.int
- Specific guidance by the EB published under http://cdm.unfccc.int
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodology (CDM-NM)
- The applied approved methodology
- The technical environment of the project (technical scope)
- Internal and national standards on monitoring and QA/QC
- Technical guideline and information on best practice

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.

Once TÜV SÜD receives a first PDD version, it is made publicly available on the internet at TÜV SÜD's webpage as well as on the UNFCCC CDM-web-pages for starting a 30 day global stakeholder consultation process (GSP). In case of any request a PDD might be revised (under certain conditions the GSP will be repeated) and the final PDD will form the basis for the final evaluation as presented by this report. Information on the first and on the final PDD version is presented at page 1.

The only purpose of a validation is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual, an initiative of Designated and Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customized for the project. TÜV SÜD developed a "cook-book" for methodology-specific checklists and protocol based on the templates presented by the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), the discussion of each criterion by the assessment team and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project 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 validation protocol consists of three tables. The different columns in these tables are described in the figure below.

The completed validation protocol is enclosed in Annex 1 to this report.

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	***Reference***	***Comments***	***PDD in GSP***	***Final PDD***
The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further subdivided. The lowest level constitutes a checklist question / criterion.	*Gives reference to documents where the answer to the checklist question or item is found in case the comment refers to documents other than the PDD.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached. In some cases sub-checklist are applied indicating yes/no decisions on the compliance with the stated criterion. Any **Request** has to be substantiated within this column*	*Conclusions are presented based on the assessment of the first PDD version. This is either acceptable based on evidence provided (☑), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification Request (CR)** is used when the validation team has identified a need for further clarification.*	*Conclusions are presented in the same manner based on the assessment of the final PDD version.*

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	***Ref. to table***	***Summary of project owner response***	***Validation team conclusion***
If the conclusions from table 1 are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 1 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the client or other project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 1, under "Final PDD".*

In case of denial of the project activity more detailed information on this decision will be presented in table 3.

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	***Id. of CAR/CR***	***Explanation of the Conclusion for Denial***
If the final conclusions from table 2 results in a denial the referenced request should be listed in this section.	*Identifier of the Request.*	*This section should present a detail explanation, why the project is finally considered not to be in compliance with a criterion.*

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD Certification Body (CB) "climate and energy". The composition of an assessment team has to be approved by the CB ensuring that the required skills are covered by the team. The CB TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Auditor (GHG-A)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team.

The validation team was consisting of the following experts:

Name	Qualification	Coverage of technical scope	Coverage of sectoral expertise	Host country experience
Abhishek Goyal	**ATL**	☑	☑	☑
Bratin Roy	**ATL**	☑	☑	☑
Sandeep Kanda	GHG-A	☑	☑	☑
Sergio Degener	GHG-A	☑	☑	
Praveen Pyata	GHG-A			☑

Abhishek Goyal[1] was an Assessment Team Leader for CDM/JI projects and environment/energy expert at the "Carbon Management Service" in the head office of TÜV SÜD Industrie Service GmbH, Germany. Before joining the TÜV SÜD Industrie Service GmbH he has worked on development of PDDs and methodologies for several energy efficiency, renewable energy, and waste to energy projects. He has extensive experience in CDM.

Bratin Roy is an Assessment Team Leader for CDM/JI projects for CDM/JI projects and also a lead auditor for quality and environmental management systems (according to ISO 9001 and ISO 14001). He holds a Master Degree in Environmental Science. Mr. Roy has worked for 7 years as a consultant in the field of energy industries, renewable and non-renewable sources, and energy distribution equipment, especially biomass and solar energy. He has received extensive training in the CDM and

[1] Subsequent to Abhishek Goyal leaving TÜV SÜD in October 2008, Bratin Roy and Sandeep Kanda have been inducted in the validation team as ATL and auditor respectively.

JI validation and verification processes and has already participated in several CDM/JI project assessments.

Sandeep Kanda is an auditor for CDM/JI projects and energy and environment field expert at TÜV SÜD Industrie Service GmbH. He holds a master degree in energy systems engineering and also industrial safety and environmental management. Before joining the TÜV SÜD Industrie Service GmbH he has worked extensively on projects in energy sector, manufacturing industries, chemical industries and metal production. He has carried out several energy audits and worked on development of CDM projects and methodologies in the aforementioned sectors.

Sergio Degener is a GHG auditor at the "Carbon Management Service" in the head office of TÜV SÜD Industrie Service GmbH, Germany. He studied environmental engineering at the University of Applied Science in Bingen, Germany. Beside his main focus in studies of environmental economics and law, he dealt with environmental management and environmental controlling issues. He has received extensive training in the CDM validation and verification processes and has already participated in several CDM project assessments.

Praveen Pyata is a CDM Auditor at TÜV SÜD South Asia. He holds a post-graduate degree in Environmental Science and Technology. Before joining TÜV SÜD South Asia he worked on biomethanation technologies, industrial waste management and waste-to-energy projects for 6 years. He also worked extensively in R& D projects on emissions reduction from livestock and agro wastes. He is based in Hyderabad, India. He has received extensive training in the CDM validation and verification processes and has already participated in several CDM project assessments.

2.2 Review of Documents

The first PDD version submitted by the client and additional background documents related to the project design and baseline were reviewed as initial step of the validation process. A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.3 Follow-up Interviews

In the period of September 20-21, 2007, TÜV SÜD performed interviews on-site with project stakeholders to confirm selected information and to resolve issues identified in the first document review. Annex 2 lists all persons interviewed in the context of this on-site visit.

2.4 Resolution of Clarification and Corrective Action Requests

The objective of this phase of validation is to resolve the requests for corrective actions and clarifications and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the validation protocol in Annex 1.

2.5 Internal Quality Control

As final step of a validation the validation report and the protocol have to undergo and internal quality control procedure by the Certification Body "climate and energy", i.e. each report has to be approved either by the head of the certification body or his deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one.

It rests at the decision of TÜV SÜD's Certification Body whether a project will be submitted for requesting registration by the EB or not.

3 SUMMARY OF FINDINGS

History of the validation process

The audit team has been provided with a draft PDD in August 2007. Based on this documentation a document review and a fact finding mission in form of an on-site audit has taken place. Afterwards the client decided to revise the PDD according to the CARs and CRs indicated in the audit process. The final PDD version submitted in February 2008 serves as the basis for the assessment presented herewith.

Project description

The project activity involves the replacement of around 500,000 tungsten filament incandescent lamps for general lighting service (GLS, less energy efficient) with OSRAM long life Compact Fluorescent Lamps (CFLs, more energy efficient) in the district of Visakhapatnam, Andhra Pradesh, India. The project activity would cover around 700,000 urban and rural households in Visakhapatnam. The project will lead to reduction in electricity consumption in the households thereby reducing consumption of fossil fuel-based electricity generated in the Southern Grid (state of Andhra Pradesh lies in Southern Grid of India) and thus reduce GHG emissions.

Findings

The key findings during validation process were related to design/configuration of the project (CR2, CR3, CAR2, CR5, CR6, CAR6, and CAR7), project implementation plan (CR7, CR14, CAR18, and CR18), baseline estimation (CR9, CR10, CR11, CAR8, CAR9, CAR10, CAR12 and CAR14) monitoring (CAR8, CAR11, CAR13, CAR14, CR15, CAR16, CR16 and CAR17) and additionality (CR8, CR12 and CR13).

All findings and our conclusion on these findings is detailed in **Table 2** of the attached validation protocol (Annex 1 of the validation report).

Considering these findings the PDD version 1 has been revised and updated PDD version 5 is in compliance with CDM requirements.

We would like to state that the project adheres to the baseline and monitoring methodology AMS II.C, version 9. Although some formulae have been elaborated that go beyond the applied methodology but we considered them to provide more input for the required parameters and hence are not considered as deviation or revision of the methodology.

Following the guidance provided in EB-42 meeting report, Paragraph 53(m), the PDD and validation report has been revised on the following points:

i) The information submitted in response to the request for review regarding the revision of the monitoring plan to include the monitoring of the baseline to be 90 days; and

ii) A requirement to replace only one GLS bulb from the location of maximum usage from each household.

The PPs have revised the PDD addressing the above said points, as follows:

1. It has been indicated in the monitoring plan of the revised PDD that the baseline metering period would be of 90 days;
2. Only one lamp would be replaced per household. The emission reduction calculations have been revised accordingly. As each replacement would be documented in the distribution form per household and the project database, thus it can be cross-checked that only one lamp per household is replaced.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC website by installing a link to TÜV SÜD's own website and invited comments by Parties, stakeholders and non-governmental organisations during a period of 30 days.

The following table presents all key information on this process:

webpage: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=3676&Ebene1_ID=26&Ebene2_ID=1102&mode=1	
Starting date of the global stakeholder consultation process: 28-08-2007	
Comment submitted by:	No comments have been received.

5 VALIDATION OPINION

TÜV SÜD has performed a validation of the following proposed CDM project activity:

Visakhapatnam (India) OSRAM CFL distribution CDM Project

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board after receiving LoA from Germany.

An analysis as provided by the applied methodology 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 as designed, the project is likely to achieve the estimated amount of emission reductions as specified within the final PDD version.

The validation is based on the information made available to us and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 10-02-2009

Thomas Kleiser

Certification Body “climate and energy”
TÜV SÜD Industrie Service GmbH

Munich, 10-02-2009

Bratin Roy

Assessment Team Leader

Annex 1: Validation Protocol

Industrie Service

Table 1

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A. General description of small-scale project activity				
A.1. Title of the small-scale project activity				
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1	Yes, the title enables to identify the project activity as distribution of Compact Fluorescent Lamps (CFL) in Visakhapatnam, India.	☑	☑
A.1.2. Are there any indication concerning the revision number and the date of the revision?	1	The GSP PDD is version 1 dated 23 August 2007.	☑	☑
A.1.3. Is this consistent with the time line of the project's history?	1,7	The real action for the project activity started with signing of Memorandum of Understanding (MOU) between Osram and Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL, the electricity distribution company) for implementation of project activity. **Clarification Request No. 1.** Please clarify when was the MOU signed with APEPDCL for implementation of the project activity and provide copy of same.	CR	☑
A.2. Description of the small-scale project activity				
A.2.1. Is the description delivering a transparent overview of the project activities?	1	The description is delivering a transparent overview of the project activity. The project activity involves distribution of energy efficient CFLs for free/minimal cost to households in entire Visakhapatnam district of Andhra Pradesh state in India. These CFLs will be distributed to households using tungsten filament incandescent light bulbs (GLS bulbs) of 60 W wattage in their living room, dining room, kitchen, bedroom and security lighting outside. In the GSP PDD, it has been stated that maximum of two bulbs will be distributed per household.	☑	☑
A.2.2. What proofs are available demonstrating that the project description is in compli-	1,4,8,9	The project is still in initial stages of planning. Based on information available from APEPDCL and sample households visited by	CR	☑

ance with the actual situation or planning?		the audit team it seems that number of households to be covered, number of bulbs that are anticipated to be replaced, average utilisation hours of bulbs and wattage of bulbs anticipated to be replaced as mentioned in PDD are not representing the correct figures. **Clarification Request No. 2.** 1. Please provide revised estimates of number of households to be covered, number of bulbs that are anticipated to be replaced, average utilisation hours of bulbs and wattage of bulbs anticipated to be replaced. Please justify the revised figures with appropriate study reports. 2. Please provide order documents for manufacturing of requisite number CFLs. 3. Please provide project activity's implementation plan highlighting the procedures to be adopted for distribution of CFLs. This should include information on number of distribution teams required, training requirement for the team members, supervision of the distribution process etc. 4. Please provide evidence that project activity envisages to cover entire districts of Visakhapatnam.		
A.2.3. Is the information provided by these proofs consistent with the information provided by the PDD?	5	See A.2.2 **Clarification Request No. 3.** Please justify the basis for replacing 60 W GLS with 15 W CFL and 100 W GLS with 20 W CFL.	CR	☑
A.2.4. Is all information presented consistent with details provided by further chapters of the PDD?	1	Information presented within the PDD is consistent.	☑	☑
A.2.5. Does the description of the technology	1	The CFL to be used in the project activity is the OSRAM DULUX	☑	☑

to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?		EL LONGLIFE with B22d base for direct replacement of incandescent lamps. The project activity envisages replacing 60 W GLS bulb with 15 W CFL and 100 W GLS bulb with 20 W CFL. The CFLs have average life of 15,000 hours and can last up to 10 years given 5 hours usage per day. Assuming that GLS bulbs of 60 W and 100 W would have continued to be used in absence of project activity during entire crediting period, the project activity would definitely reduce greenhouse gas emissions by reducing electricity consumption in the households. The households are being served electricity from Southern region grid of India, which is dominated by fossil fuels.		
A.2.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	1	The explanation of how the project activity will reduce greenhouse gas emissions is suitable. Please see A.2.5.	CAR	☑
A.3. Project participants				
A.3.1. Is the form required for the indication of project participants correctly applied?	1	Yes, the form has been correctly applied.	☑	☑
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	19	**Open issue** Please provide letter of Approval from Indian DNA and German DNA.	Open issue	☑
A.3.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1	The information is mostly consistent within the PDD. **Corrective Action Request No.1.** The name of private entity from India mentioned in section A.3 is not consistent with that mentioned in Annex 1.	CAR	☑
A.4. Technical description of the small-scale project activity				
A.4.1. *Location of the small-scale project activity*				
A.4.1.1. Does the information provided on the location of the project activity allow for a	1	**Corrective Action Request No.2.** The project activity envisages to cover only the rural area of the district of Visakhapatnam. However, all Mandals are defined and	CAR	☑

clear identification of the site(s)?		included in the PDD. Please include only the Mandals where the distribution will take place.		
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	7	See A.1.3	CR	☑
A.4.2. *Type and category(ies) and technology/measure of the small-scale project activity*				
A.4.2.1. To which type(s) does the project activity belong to? Is the type correctly identified and indicated?	1,2	The project activity belongs to Type II, Energy Efficiency Improvement Projects and the type has been correctly identified and indicated in the PDD.	☑	☑
A.4.2.2. To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	2	The project activity belongs to category II.C-*Demand-side energy efficiency activities for specific technologies.* **Corrective Action Request No.3.** The category of the project activity has not been correctly identified in section A.4.2 of the PDD. Please revise.	CAR	☑
A.4.2.3. Does the technical design of the project activity reflect current good practices?	5	The project activity envisages to use energy efficient long life CFLs in place of GLS bulbs. The life of the CFLs to be used is not commonly available in the market.	☑	☑
A.4.2.4. Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country (ies)?	1	Yes, technology for manufacturing long life CFLs will be transferred from Osram Germany to Osram India. **Clarification Request No. 4.** Please provide evidence of technology transfer from Osram Germany to Osram India for manufacturing of kind of bulbs that would be distributed as part of project activity.	CR	☑
A.4.2.5. Is the technology implemented by the project activity environmentally safe?	10	The long utilisation hours of the project activity bulbs would help to reduce the waste in form of glass, plastic etc. compared to GLS bulbs. Further Osram has developed technology that uses minimum amount of mercury required to light CFL. **Clarification Request No. 5.**	CR	☑

		Please provide evidence to prove that CFLs to be used in the project activity will use ≤ 2,5 mg of mercury and this amount is less compared to other CFLs available in the market.		
A.4.2.6. Is the information provided in compliance with actual situation or planning?	1	See A.4.2.5	CR	☑
A.4.2.7. Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country?	5	The project activity envisages to use energy efficient long life CFLs in place of GLS bulbs. These CFLs have longer life and are more energy efficient than commonly used GLS bulbs.	☑	☑
A.4.2.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1	**Clarification Request No. 6.** Please clarify if there is possibility of replacement of CFLs distributed as part of project activity with more energy efficient CFLs during crediting period. Please justify the response with reasoning and define measures to be adopted to avoid such replacement.	CR	☑
A.4.2.9. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1	Yes, the project would require extensive training for distribution of CFLs and collection of GLS bulbs, data recording during distribution process, data compilation, destruction and disposal of collected GLS bulbs, data collection during monitoring from project sample and cross-check groups etc.	☑	☑
A.4.2.10. Is information available on the demand and requirements for training and maintenance?	11,12,13	**Clarification Request No. 7.** Please provide information on training needs identified for implementation of various stages of the project activity especially distribution of CFLs and collection of GLS bulbs, data recording during distribution process, data compilation, destruction and disposal of collected GLS bulbs, data collection during monitoring from project sample and cross-check groups etc. Further provide evidence of training plan to fulfil the identified training needs.	CR	☑
A.4.2.11. Is a schedule available for the implementation of the project and are there any	1	The schedule for implementation of the project activity is not available in the PDD.	CAR	☑

risks for delays?		**Corrective Action Request No.4.** Please provide the schedule for implementation of project activity in the PDD.		
A.4.3. *Estimated amount of emission reductions over the chosen crediting period*				
A.4.3.1. Is the form required for the indication of projected emission reductions correctly applied?	1	Yes, the form has been correctly applied.	☑	☑
A.4.3.2. Are the figures provided consistent with other data presented in the PDD?	1	Yes, the figures are consistent within the PDD.	☑	☑
A.4.3.3. Are the figures consistent with the small-scale criteria for the used Type?	1,2	The energy saving corresponding to the emission reductions mentioned in the PDD is within 60 GWh_e as required for small scale project activities using Type II methodologies. However, please see A.2.2	CR	☑
A.4.4. *Public funding of the small-scale project activity*				
A.4.4.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	20	**Clarification Request No. 8.** Please provide information on project financing plan.	CR	☑
A.4.4.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1	The information is consistent within the PDD.	☑	☑
A.4.5. *Confirmation that the small-scale project activity is not a debundled component of a large scale project activity*				

<table>
<tr><td>A.4.5.1. Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity: with the following characteristics:</td><td>1</td><td><table><tr><th>Debundling checklist</th><th>Yes / No</th></tr><tr><td>the same project participants?</td><td>Yes</td></tr><tr><td>In the same project category and technology/measure?</td><td>Yes</td></tr><tr><td>Registered within previous two years? Or in registration process?</td><td>Yes</td></tr><tr><td>Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?</td><td>No</td></tr></table>There is one similar project being developed by same project participants in same project category but it is located in state of Haryana. Haryana is in northern part of India, far away from Andhra Pradesh (state where project activity is located) that is located in south eastern part of India.
<u>Corrective Action Request No.5.</u>
PDD should provide in section A.4.5, details of other similar projects being developed by project participants in different parts of India.</td><td>CAR</td><td>☑</td></tr>
<tr><td>A.4.5.2. If the answer to all the above question is ‘Yes’ then does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?</td><td>1</td><td>Not applicable.</td><td>☑</td><td>☑</td></tr>
<tr><td colspan="5">B. Application of a baseline and monitoring methodology</td></tr>
<tr><td colspan="5">B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity</td></tr>
<tr><td>B.1.1.1. Are reference number, version number, and title of the baseline and monitoring methodology clearly indi-</td><td>1,2</td><td>Yes, the baseline methodology AMS II.C, version 9 has been used.</td><td>☑</td><td>☑</td></tr>
</table>

<table>
<tr><td>cated?</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.1.1.2. Is the applied version the most recent one and / or is this version still applicable?</td><td>2</td><td>Yes, the version used is the most recent one.</td><td>☑</td><td>☑</td></tr>
<tr><td colspan="5">B.2. Justification of the choice of the project category</td></tr>
<tr><td>B.2.1. Is the applied methodology considered the most appropriate one?</td><td>2</td><td>Yes, the applied methodology AMS II.C-Demand-side energy efficiency activities for specific technologies, is the most appropriate small scale methodology for this kind of project activity which involves energy efficiency at consumption side by distribution of more efficient light bulbs to replace less efficient light bulbs.</td><td>☑</td><td>☑</td></tr>
<tr><td colspan="5">Integrate the required amount of sub-checklists on the applicability criteria as given by the applied methodology and comment on at least every line answered with “No”;t</td></tr>
<tr><td>B.2.1.1. Criterion 1: This category comprises activities that encourage the adoption of energy-efficient equipment, lamps, ballasts, refrigerators, motors, fans, air conditioners, appliances, etc. at many sites.</td><td>1</td><td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>The project activity involves replacement of less efficient GLS bulbs with CFLs at several thousand households in Visakhapatnam district.</td><td>☑</td><td>☑</td></tr>
<tr><td>B.2.1.2. Criterion 2: The technologies may replace existing equipment or be installed in new sites.</td><td>1</td><td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>The project activity involves replacement of less efficient GLS bulbs with CFLs. In section A.2 of the PDD it has been clearly stated that 60 W GLS bulb will be replaced with 15 W CFL and 100 W GLS bulb will be replaced with 20 W CFL. Hence there would be no distribution of CFLs in households that have been</td><td>☑</td><td>☑</td></tr>
</table>

		newly constructed.		
B.2.1.3. Criterion 3: The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh_e per year.	1,8	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>No</td></tr><tr><td>Compliance verified?</td><td>No</td></tr></table> **Corrective Action Request No.6.** The energy saving corresponding to the emission reductions mentioned in the PDD is within 60 GWh_e as required for small scale project activities using Type II methodologies. However, based on information available from APEPDCL and sample households visited by the audit team it seems that number of households to be covered, number of bulbs that are anticipated to be replaced, average utilisation hours of bulbs and wattage of bulbs anticipated to be replaced as mentioned in PDD are not representing the correct figures. These figures should be reworked and then it should be proved that energy savings from the project activity would not exceed 60 GWh_e per year.	CAR	☑
B.3. Description of the project boundary				
B.3.1. Does the project boundary include physical, geographical site of the industrial facility, processes or equipment that are affected by the project activity??	1	The project boundary is considered as physical location of each CFL installed in place of GLS bulb. List of all the households in Visakhapatnam districts connected to the electricity distribution system is available with APEPDCL and same will be used to identify the households to which the CFL would be distributed. Project boundary also includes all power plants connected to Southern region grid from where the Visakhapatnam district gets electricity. **Corrective Action Request No.7.** The distinct geographical boundary of Visakhapatnam should be clearly documented in PDD using GPS data.	CAR	☑
B.3.2. Do the spatial and technological boundaries as verified on-site comply with the	1	Yes.	☑	☑

discussion provided by / indication included to the PDD?				
B.4. Description of baseline and its development				
B.4.1. Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed by the PDD? Why can this list be considered as being complete?	1	The feasible baseline scenario identified in the PDD is continuation of current practice i.e utilisation of lighting appliances used before implementation of project activity. **Clarification Request No. 9.** Please clarify why autonomous replacement of inefficient bulbs with more efficient light bulbs over the crediting period has not been considered as a baseline scenario.	CR	☑
B.4.2. Does the project identify correctly and excludes those options not in line with regulatory or legal requirements?	1	**Clarification Request No. 10.** Please clarify how the impact of regulatory requirements for use of CFLs in the host country or region, implemented during crediting period, will be taken into consideration.	CR	☑
B.4.3. Have applicable regulatory or legal requirements been identified?	1	No, all the applicable legal and regulatory requirements have not been identified. **Clarification Request No. 11.** As per the discussions held with the senior officials of APEPDCL it is understood that for any household applying for a load increase, it is mandatory to use efficient light bulbs and they cannot use GLS bulbs. How is this regulatory requirement taken into consideration in identification of baseline scenario?	CR	☑
B.4.4. Does the PDD identify the most likely baseline scenario in absence of the project activity?	1	The feasible baseline scenario identified in the PDD is continuation of current practice i.e utilisation of lighting appliances used before implementation of project activity.	☑	☑
B.4.5. Is this identification supported by official and/or verifiable documents (e.g. studies,	1	See B.4.1	CR	☑

web pages, certificates, etc?				
B.4.6. Is the identified baseline scenario in line with regulatory or legal requirements?	1	See B.4.2	CR	☑
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:				
B.5.1. In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	1	Additionality tool has not been used.	☑	☑
B.5.2. In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	1	Please see above B.5.1.	☑	☑
B.5.3. In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1	Please see above B.5.1.	☑	☑
B.5.4. In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1	Please see above B.5.1.	☑	☑
B.5.5. In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	1	Please see above B.5.1.	☑	☑
B.5.6. In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for the utilized data?	1	Please see above B.5.1.	☑	☑
B.5.7. In case of applying step 3 (barrier analy-	1	Please see above B.5.1.	☑	☑

	sis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?				
B.5.8.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	1	Please see above B.5.1.	☑	☑
B.5.9.	In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?	1	Please see above B.5.1.	☑	☑
B.5.10.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	1	Please see above B.5.1.	☑	☑
B.5.11.	If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	1	Please see above B.5.1.	☑	☑
B.5.12.	Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers (step 5)?	1	Please see above B.5.1.	☑	☑
If the additionality tool has not been used please answer B.5.13 to B.5.18					
B.5.13.	If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity?	7	**Clarification Request No. 12.** Please provide evidence to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity.	CR	☑

B.5.14. Is a complete list of barriers developed that prevents the project activity to occur?		Investment barrier has been discussed.		
B.5.15. Does this list include at least one of the following barriers?	20	<table><tr><th>Barrier</th><th>Discussed?</th><th>Verifiable?</th></tr><tr><td>Investment</td><td>Yes</td><td>No</td></tr><tr><td>Technological</td><td>No</td><td>NA</td></tr><tr><td>Due to prevailing practice</td><td>No</td><td>NA</td></tr><tr><td>Other</td><td>No</td><td>NA</td></tr></table> **Clarification Request No. 13.** Please provide documentary evidence for fee that will be charged from households to whom CFLs would be distributed, cost of CFLs, fixed costs and other costs anticipated in the implementation of project activity.	CR	☑
B.5.16. Does the discussion sufficiently take into account relevant national and/or sectoral policies?	1	See B.4 above	☑	☑
B.5.17. Is transparent and documented evidence provided on the existence and significance of these barriers?	1	See B.5.15	☑	☑
B.5.18. Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	1	The project activity has negative NPV without CDM revenues and it becomes positive with CDM revenue.	☑	☑
B.6. Emissions reductions				
B.6.1. *Explanation of methodological choices*				
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1	The procedures provided in the methodology are not clearly defined. Please see below.	☑	☑

B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	1	The project activity chooses to record the power rating of CFLs distributed in the project activity and monitor the operating hours of sample of CFLs installed in the project activity.	☑	☑
B.6.1.3. Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	18	The formula has not been correctly presented. **Corrective Action Request No.8.** The formula for calculating the total power rating of CFLs in the project activity as used in excel calculation tool is not same as that defined in the methodology. Please revise. **Corrective Action Request No.9.** The PDD says that average operating hours of the sample household monitored will used for calculating energy consumed in the project activity however, the excel calculation tool adjusts the operating hour data for the margin of error at 95% confidence interval as required by guidance from CDM EB. This approach is conservative and should be defined transparently in the PDD giving formula for calculation of mean and standard deviation also. All the values of parameters used should be stated in the PDD. **Corrective Action Request No.10.** Standard normal for a confidence level of 95% 'z' should be used in the formula for calculating project energy consumption.	CAR	☑
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	1,6	CARs mentioned in B.6.1.3 are applicable to baseline also. Further: **Corrective Action Request No.11.** The project envisages to use data of operating hours as monitored in 'project sample groups' (PSG) for both baseline and project energy calculation. This approach is not in line with methodology. In absence of 'baseline sample groups' (BSG), the operat-	CAR	☑

		ing hours to be used for baseline energy consumption should be fixed ex-ante based on sampling conducted over statistically representative households. This data should be presented in section B.6.2 of the PDD.		
B.6.1.5. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	15	Project activity envisages to destroy all the GLS bulbs collected during replacement of GLS bulbs with CFLs. **Clarification Request No. 14.** The project activity implementation plan should be described in the PDD, which should mention as to how it would be ensured that all the GLS bulbs collected would be destroyed to avoid there usage at some other place. In case all replaced GLS bulbs are not collected and destroyed then how will the leakage be estimated.	CAR	☑
B.6.1.6. Are the formulae required for the determination of emission reductions correctly presented?	18	Yes, the emission reductions will be calculated as product of difference of baseline and project energy consumption and grid emission factor.	☑	☑
B.6.2. *Data and parameters that are available at validation*				
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?	1	Please see below.	☑	☑
B.6.2.2. Comment on any line answered with "No"				
B.6.2.2.1. Parameter title: emission coefficient of fossil fuel used by industrial facility/process/equipment	1	Not applicable. There is no thermal energy included in project boundary.	☑	☑

<table>
<tr>
<td>B.6.2.2.2. Parameter Title: Emission factor of the grid (CM)</td>
<td>1</td>
<td>
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided?</td><td>Yes</td></tr>
<tr><td>Has this value been verified?</td><td>No</td></tr>
<tr><td>Choice of data correctly justified?</td><td>Yes</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
</table>
The PDD lists the grid emission factor in section B.7.1.
<u>Corrective Action Request No.12.</u>
Please clarify if project activity intends to use ex-ante or ex-post grid emission factor value.
</td>
<td>CAR</td>
<td>☑</td>
</tr>
<tr>
<td>B.6.2.2.3. Parameter Title: Operating margin (OM) emission factor of the grid</td>
<td>1</td>
<td>Not Applicable

The PDD refers to grid emission factor from data published by Central Electricity Authority, Govt. of India.</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>B.6.2.2.4. Parameter Title: Build margin (BM) emission factor of the grid</td>
<td>1</td>
<td>See B.6.2.2.4.</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>B.6.2.2.5. Parameter Title: Fuel consumption of each power source</td>
<td>1</td>
<td>See B.6.2.2.4.</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>B.6.2.2.6. Parameter Title: Emission coefficient of each fuel</td>
<td>1</td>
<td>See B.6.2.2.4</td>
<td>☑</td>
<td>☑</td>
</tr>
</table>

<table>
<tr><td>B.6.2.2.7. Parameter Title: Fraction of time with low costs /must run plant at the margin
(for simple adjusted OM only)</td><td>1</td><td>See B.6.2.2.4</td><td>☑</td><td>☑</td></tr>
<tr><td>B.6.2.2.8. Parameter Title: Electricity imports</td><td>1</td><td>See B.6.2.2.4</td><td>☑</td><td>☑</td></tr>
<tr><td>B.6.2.2.9. Parameter Title: CO_2 emission coefficient of fuels used in connected grids.</td><td>1</td><td>See B.6.2.2.4</td><td>☑</td><td>☑</td></tr>
<tr><td>B.6.2.2.10. Parameter Title: average annual operating hours of the devices of the group of the devices replaced</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table>See B.6.1.4 for CAR on operating hours to be used in baseline.</td><td>CAR</td><td>☑</td></tr>
<tr><td colspan="5">B.6.3. Ex-ante calculation of emission reductions</td></tr>
<tr><td>B.6.3.1. Is the projection based on the same procedures as used for future monitoring?</td><td>1</td><td>▪ The number of bulbs to be replaced is based on pre-study conducted before start of validation however, the actual number will be recorded when CFLs are distributed
▪ The wattage of GLS bulbs and CFL bulbs is based on a pre-study conducted before start of validation however, actual wattage will be recorded when CFLs are distributed</td><td>CAR</td><td>☑</td></tr>
</table>

		▪ The operating hours for baseline and project energy estimation are based on pre-study conducted before start of validation. The operating hours for baseline have to be fixed ex-ante based on pre-study however those for project activity would be measured through sampling in PSG. **Corrective Action Request No.13.** The PDD should clearly define the procedure to arrive at the wattage of CFLs that will be used for calculating the project energy consumption during monitoring. **Corrective Action Request No.14.** The PDD define how baseline and project energy data will be adjusted in case project CFL is found missing or not working or replaced with other bulb during sampling in PSG and project cross-check group (PCCG). What is the basis for assuming that every year 1% CFLs will be out of order? Will this factor be used during actual monitoring also?		
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	1	The GHG calculations are not documented in complete manner. See B.6.1.3	CAR	☑
B.6.3.3. If there is more than one component of the project activity, then, are emission reduction calculations provided separately for each component?	1	There is only component of the project activity.	☑	☑
B.6.3.4. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1	Data is consistent within the PDD.	☑	☑
B.6.4. *Summary of the ex-ante estimation of emission reductions*				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline sce-	1	Yes, the project activity would use energy efficient CFL lamps which are supposed to consume less energy than a GLS bulb to	☑	☑

nario?		provide same lumen.		
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1	Yes, the table has been correctly applied.	☑	☑
B.6.4.3. If the project activity involves more than one component, is separate table included for each of the component.	1	Not applicable.	☑	☑
B.6.4.4. Do these values comply with small-scale criteria for every year?	1	There is no limitation on number of emission reductions for Type II project activities.	☑	☑
B.6.4.5. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1	See A.4.2.11	CAR	☑
B.6.4.6. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	1	Yes, the data is consistent within the PDD.	☑	☑
B.7. Application of the monitoring methodology and description of the monitoring plan				
B.7.1. *Data and parameters monitored*				
B.7.1.1. Is the list of parameters presented in chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	1	No, please see below.	☑	☑
B.7.1.2. In case of replacement, modification and retrofit measures. Comment on any line answered with "No"				

<table>
<tr>
<td>B.7.1.2.1. Parameter Title: number of devices of the group of ‘i’ devices replaced</td>
<td>17</td>
<td>
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided for estimation?</td><td>No</td></tr>
<tr><td>Has this value been verified?</td><td>No</td></tr>
<tr><td>Measurement method correctly described?</td><td>Yes</td></tr>
<tr><td>Correct reference to standards?</td><td>NA</td></tr>
<tr><td>Indication of accuracy provided?</td><td>NA</td></tr>
<tr><td>QA/QC procedures described?</td><td>No</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>No</td></tr>
</table>
<u>Corrective Action Request No.15.</u>
The PDD should provide an extract of database that would be used to compile the entire project data including number of bulbs replaced, wattage of bulbs replaced, number of CFLs installed, wattage of CFLs installed, address of household where CFLs installed, date when GLS replaced with CFL in particular household, list of PSG households, data to be collected during spot check and cross check etc.
</td>
<td>CAR</td>
<td>☑</td>
</tr>
<tr>
<td>B.7.1.2.2. Parameter Title: number of devices of the group of ‘i’ devices installed</td>
<td>17</td>
<td>
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided for estimation?</td><td>No</td></tr>
<tr><td>Has this value been verified?</td><td>No</td></tr>
<tr><td>Measurement method correctly described?</td><td>Yes</td></tr>
<tr><td>Correct reference to standards?</td><td>NA</td></tr>
</table>
</td>
<td>CAR</td>
<td>☑</td>
</tr>
</table>

		Indication of accuracy provided? NA QA/QC procedures described? No QA/QC procedures appropriate? No See B.7.1.2.1		
B.7.1.2.3. Parameter Title: power of the devices of the group of 'i' devices replaced	17	Monitoring Checklist / Yes / No Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided for estimation? No Has this value been verified? No Measurement method correctly described? No Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? No QA/QC procedures appropriate? No See B.7.1.2.1 **Clarification Request No. 15.** Please clarify as to how the power rating of replaced GLS bulb will be recorded. If it is based on nameplate data then what will be done in case there is no wattage labelling on the bulb.	CAR CR	☑
B.7.1.2.4. Parameter Title: power of the devices of the group of 'i' devices installed	17	Monitoring Checklist / Yes / No Title in line with methodology? Yes	CAR	☑

		Data unit correctly expressed? — Yes Appropriate description of parameter? — Yes Source clearly referenced? — Yes Correct value provided for estimation? — No Has this value been verified? — No Measurement method correctly described? — Yes Correct reference to standards? — NA Indication of accuracy provided? — NA QA/QC procedures described? — No QA/QC procedures appropriate? — No See B.7.1.2.1		
B.7.1.2.5. Option 1: average annual operating hours of the devices of the group of the devices installed	14,16,17,	Monitoring Checklist — Yes / No Title in line with methodology? — Yes Data unit correctly expressed? — Yes Appropriate description of parameter? — Yes Source clearly referenced? — No Correct value provided for estimation? — No Has this value been verified? — No Measurement method correctly described? — No Correct reference to standards? — NA Indication of accuracy provided? — No QA/QC procedures described? — No QA/QC procedures appropriate? — No See B.7.1.2.1 **Clarification Request No. 16.** Please clarify as to how the PSG will be selected is statistically representative manner and define the households to be included in this group.	CAR CR	☑

<table>
<tr><td></td><td></td><td><u>Corrective Action Request No.16.</u>
PDD should provide the details of metering equipment to be used for measuring operating hours. It should include the monitoring procedure, its accuracy, required calibration frequency. PDD should also mention the frequency of data recording from this meter.</td><td></td><td></td></tr>
<tr><td>B.7.1.2.6. Option 2: energy use of an appropriate sample of the devices installed</td><td></td><td>Not applicable. The project activity monitors the operating hours of CFL.</td><td>☑</td><td>☑</td></tr>
<tr><td>B.7.1.2.7. Parameter Title: checks of sample of non-metered systems to ensure that they are still operating</td><td>1,13</td><td><table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table><u>Corrective Action Request No.17.</u>
The PDD should establish the procedure for conducting cross-check in non-metered households as required by the methodology. It should also mention the data that will be captured during this cross check and how will it be utilised in calculation of emission reductions during verification.</td><td>CAR</td><td>☑</td></tr>
<tr><td colspan="5">B.7.2. Description of the monitoring plan</td></tr>
<tr><td>B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situa-</td><td>15</td><td>No, the operational and management structure as not been defined in the PDD.</td><td>CAR</td><td>☑</td></tr>
</table>

tion?		**Corrective Action Request No.18.** The project implementation plan should be attached to the PDD. It should clearly indicate the responsibilities of different parties in various stages of project implementation viz. planning, CFL distribution, data collection, data compilation, waste handling, data monitoring etc.		
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	15	No, please see B.7.2.1	CAR	☑
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	15	No, please see B.7.2.1	CAR	☑
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	1	No additional information has been provided in annex 4	☑	☑
B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)				
B.8.1.1. Is there any indication of a date when the baseline was determined?	1	Yes.	☑	☑
B.8.1.2. Has dd/mm/yyyy format been used to indicate the date.	1	Yes.	☑	☑
B.8.1.3. Is this consistent with the time line of the PDD history?	1	Yes.	☑	☑
B.8.1.4. Is the information on the person(s) / entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1	Yes, Osram GmbH and Perspectives Climate Change GmbH are responsible for application of baseline and monitoring methodology.	☑	☑

B.8.1.5. Is information provided whether this person / entity is also considered a project participant?	1	**Corrective Action Request No.19.** It should be mentioned in section B.8 of the PDD if Perspectives Climate Change GmbH is also project participant and contact details should be provided.	CAR	☑
C. Duration of the project activity / crediting period				
C.1. Duration of the project activity				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1,7	The operational lifetime is reasonable. **Corrective Action Request No.20.** The starting date of the project activity should be mentioned as earlier date of start of implementation or real action.	CAR	☑
C.2. Choice of the crediting period and related information				
C.2.1. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	1	Yes, fixed 10 year crediting period has been used.	☑	☑
C.2.2. Has dd/mm/yyyy format been used to indicate the start date of the crediting period.	1	Yes. **Clarification Request No. 17.** Please clarify if project participants plan to start the crediting period after distribution of CFLs in the total project area.	CR	☑
D. Environmental impacts				
D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	1	There are no host country requirements for EIA for this kind of project activity. However, likely environmental impacts have been discussed in the PDD.	☑	☑

If yes answer also D.1.2 to D.1.4				
D.1.2. Has the analysis of the environmental impacts of the project activity been sufficiently described?	1	Yes.	☑	☑
D.1.3. Will the project create any adverse environmental effects?	1	The project is likely to create adverse environmental impacts due destruction of collected GLS bulbs.	☑	☑
D.1.4. Were transboundary environmental impacts identified in the analysis?	1	NA	☑	☑
D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party				
D.2.1. Have the identified environmental impacts been addressed in the project design sufficiently?	15	**Clarification Request No. 18.** Please clarify how the waste generated due to destruction of collected GLS bulbs will be handled to minimise environmental impacts.	CR	☑
D.2.2. Does the project comply with environmental legislation in the host country?	1	Yes.	☑	☑
E. Stakeholders' comments				
E.1. Brief description how comments by local stakeholders have been invited and compiled				
E.1.1. Have relevant stakeholders been consulted?	21	Yes.	☑	☑
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	1	The announcement for stakeholder consultation meeting was made in local newspapers and then the meeting was conducted on specified date to invite comments.	☑	☑
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such	1	No stakeholder consultation is required in host country for this kind of project activity.	☑	☑

regulations/laws?				
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1	Yes, the PDD transparently defines the stakeholder consultation process adopted.	☑	☑
E.2. Summary of the comments received				
E.2.1. Is a summary of the received stakeholder comments provided?	21	Yes	☑	☑
E.3. Report on how due account was taken of any comments received				
E.3.1. Has due account been taken of any stakeholder comments received?	1	No, the stakeholders concerns regarding disposal of destroyed GLS bulbs has not been addressed. See D.2.1	CR	☑
F. Annexes 1 - 4				
F.1. Annex 1: Contact Information				
F.1.1. Is the information provided consistent with the one given under section A.3?	1	Yes	☑	☑
F.1.2. Is the information on all private participants and directly involved Parties presented?	1	Yes	☑	☑
F.2. Annex 2: Information regarding public funding				
F.2.1. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,20	See A.4.4.1	CR	☑
F.2.2. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1	**Clarification Request No. 19.** Please provide a confirmation that no ODA funding is involved in the project activity.	CR	☑
F.3. Annex 3: Baseline information				

F.3.1. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1	Yes	☑	☑
F.3.2. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1	Yes	☑	☑
F.3.3. Does the additional information substantiate / support statements given in other sections of the PDD?	1	Yes	☑	☑
F.4. Annex 4: Monitoring information				
F.4.1. If additional background information on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?	1	NA	☑	☑
F.4.2. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1	NA	☑	☑
F.4.3. Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1	NA	☑	☑

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Clarification Request No. 1. Please clarify when was the MOU signed with APEPDCL for implementation of the project activity and provide copy of same.	A.1.3	The relevant parts of the MoU have been signed on 08.05.2007. The MoU has been provided to TÜV SÜD. The content of the MoU itself is confidential. See VP Annex 1 MoU (Page 1 plus last page)	☑ The signed copy of MoU between Osram and APEPDCL has been submitted to audit team. The MoU states that the CFL distribution project at Visakhapatnam would be jointly developed by Osram and APEPDCL as a CDM project.
Clarification Request No. 2. 1. Please provide revised estimates of number of households to be covered, number of bulbs that are anticipated to be replaced, average utilisation hours of bulbs and wattage of bulbs anticipated to be replaced. Please justify the revised figures with appropriate study reports. 2. Please provide order documents for manufacturing of requisite number CFLs. 3. Please provide project activity's implementation plan highlighting the procedures to be adopted for distribution of CFLs. This should include information on number of distribu-	A.2.2	1. The revised estimates have been done with taking into account the results from the pre-study conducted in October 2007. All information has been provided in PDD Section A.2 and B.2. For further justification see pre-study results (VP Annex 2 and 3). The documents of the pre-study are confidential. 2. The order documents for manufacturing of CFL parts, shipment orders as well as order dates of manufacturing in the Osram India factory in Sonepat have been confidentially provided to TÜV SÜD. See VP Annex 4 and 5 (confidential).	☑ 1. The complete list of households in Visakhapatnam, which are connected to grid and are registered customer of APEPDCL (the only distribution company in the area) has been obtained from APEPDCL. The total number of households participating is approximately 700,000. Further as per guidance by EB-42, the distribution of CFL lamps would be limited to only one lamp per household. Majority of GLS bulbs to be replaced will be 60 W (approximately 90%). This could be established from the pre-study conducted by Osram. The average utilisation hours based on

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
tion teams required, training requirement for the team members, supervision of the distribution process etc. 4. Please provide evidence that project activity envisages to cover entire district of Visakhapatnam.		3. The project implementation plan with all necessary information about procedures in chronological order has been provided in PDD section B.7.2. Regarding the number of distribution teams and the training concept see also training concept for distribution (VP Annex 7 - confidential). 4. The project will cover the entire district of Visakhapatnam. See PDD Section A.2 and B.2. Evidence that project activity covers the whole district of Visakhapatnam (see PDD Enclosure 1 “Database households Visakhapatnam”).	pre-study are estimated to be 3.5 hours per day however, as per information available from The Energy & Resource Institute (2007): Handbook for franchise development in the rural electricity distribution sector (page 25), TERI Press, New Delhi, India, 2007, ISBN 81-7993-113-7, the average utilisation hours for an incandescent lamp and CFL in India are 5 per day. The data from TERI study has been used to estimate the baseline emissions and project emissions at validation stage. The actual utilisation hours for baseline case (incandescent lamps) will be monitored after project validation in sample households to arrive at baseline emissions. The actual utilisation hours for project case (CFL) will also be monitored after project registration in sample households to arrive at project emissions. Usage of higher utilisation hours to estimate the baseline and project emissions at validation would ensure that project activity would remain under limits of small scale during

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			crediting period. 2. The lamps will be assembled at Osram India factory in Sonepat, Haryana. The documents for release of requisite number of lamp parts from Osram Germany to Osram India have been submitted to the audit team. 3. Detailed training plan with training structure for distribution teams, number of required team members, and aspects to be covered by trainers in training has been submitted to the audit team. The detailed project implementation plan highlighting the steps in implementation, party responsible for action and party supervising the process has been provided. The plan is deemed appropriate to facilitate successful implementation of the project activity. 4. The complete list of households in Visakhapatnam, which are connected to grid and are registered customer of APEPDCL (the only distribution company in the area) has been obtained from APEPDCL. The total number of

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			households available from this list would be participating in the project activity.
Clarification Request No. 3. Please justify the basis for replacing 60 W GLS with 15 W CFL and 100 W GLS with 20 W CFL.	A.2.3	The justification of replacing the GLS with CFL as described in the PDD has been provided in transparent manner. See PDD section A.2 –Table 1 and PDD Enclosure 2. • Specification sheet of German CFL (Lumen) • Information of the standard exchange rate regarding Lumen (GLS-CFL) in Germany and India	☑ The lumen output for 15W CFL is more than that for a 60W incandescent lamp and hence 60W incandescent bulb is replaced by 11W CFL in European market. It is justified if 60W incandescent lamp in the project activity is replaced by 15W CFL. The lumen output for 20W CFL is less than that for a 100W incandescent lamp however still 100W incandescent bulb is replaced by 20W CFL in European market. It is deemed acceptable if 100W incandescent lamp in the project activity is replaced by 20W CFL
Open issue Please provide letter of Approval from Indian DNA and German DNA.	A.3.2	The LoA India has been provided and sent to the TÜV Süd. The LoA Germany will be sent to the TÜV as soon as received.	☑ LoAs from India and Germany have been submitted.
Corrective Action Request No.1. The name of private entity from India mentioned in section A.3 is not consistent with that mentioned in Annex 1.	A.3.3	The name has been adjusted accordingly. See PDD section A.3.	☑

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Corrective Action Request No.2. The project activity envisages to cover only the rural area of the district of Visakhapatnam. However, all Mandals are defined and included in the PDD. Please include only the Mandals where the distribution will take place.	A.4.1.1	The project will cover the entire district of Visakhapatnam. See PDD Section A.2 and B.2. Evidence that project activity covers the whole district of Visakhapatnam (see PDD Enclosure 1 "Database households Visakhapatnam").	☑ The complete list of households in Visakhapatnam, which are connected to grid and are registered customer of APEPDCL (the only distribution company in the area) has been obtained from APEPDCL. The total number of households available from this list would be participating in the project activity.
Corrective Action Request No.3. The category of the project activity has not been correctly identified in section A.4.2 of the PDD. Please revise.	A.4.2.2	Type (ii): Energy efficiency improvement projects. Category: C. Demand-side energy efficiency programmes for specific technologies. See also PDD section A 4.2.	☑
Clarification Request No. 4. Please provide evidence of technology transfer from Osram Germany to Osram India for manufacturing of kind of bulbs that would be distributed as part of project activity.	A.4.2.4	For the first project CFL components will be imported from Germany/Italy. The assembly of the components will be undertaken in Sonepat factory and assembly technology and know-how will be transferred from Germany. Additionally, the project activity of OSRAM in Visakhapatnam has to be seen in a much wider scope. OSRAM is planning to implement several such project activities (stake holder consultations held already in Sonepat & Yamunanagar and Pune) and is currently building a new production plant near Delhi that will include a manufacturing line for	☑ It is understood that for CFLs to be used in the project activity, parts will be shipped from Germany to India where they will be assembled at Osram India factory in Sonepat, Haryana. Simultaneously Osram Germany is in the process of providing technical know-how to Osram India so that long life CFLs could be manufactured in India in future.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		15,000-hour CFLs to supply those project activities with high-quality long-life CFLs from India. This line will be the first of its kind in India. Furthermore these projects will lead to lower mercury contents in CFLs produced by OSRAM India. OSRAM India will cut down the mercury content in its new production line from 4,5 to 2,5 mg/CFL. See PDD section D.2 and VP Annex 6 (confidential).	
Clarification Request No. 5. Please provide evidence to prove that CFLs to be used in the project activity will use ≤ 2,5 mg of mercury and this amount is less compared to other CFLs available in the market.	A.4.2.5	The CFLs used in the project will use ≤ 2,5 mg of mercury. These lamps are produced in Germany and the assembly will take place in India. This is done because OSRAM India has so far no production line for producing CFL with a life-time of 15.000 h. OSRAM India is currently building a new production plant near Delhi that will include a manufacturing line for 15,000-hour high-quality long-life CFLs. This line will be the first of its kind in India. OSRAM India will cut down the mercury content in its new production line from 4.5 to 2.5 mg/CFL. For further details see VP Annex 6 and PDD section D.2.	☑ Material specification sheet has been provided to the audit team which clearly indicates that CFLs to be used in the project activity would use 2.5 ± 0.5 mg of mercury. Pill dosing system is used which would ensure exact amount of mercury per lamp. Claim that this mercury content is less compared to CFLs available from other manufacturers has been removed from the PDD.
Clarification Request No. 6. Please clarify if there is possibility of replacement of CFLs distributed as part of project activity with more energy efficient CFLs during crediting period. Please justify the response with reasoning and define	A.4.2.8	The 15,000-hour CFL is a product which is currently not available in the Indian market. It has a technical lifetime of around 10 years. As this kind of CFL provides the household the opportunity to cut down its electricity bill for lighting by 80% for a period of around ten	☑ The project activity would use 15,000 hours lamp, which are supposed to last for about 10 years (crediting period). Given the high of cost replacement and already sub-

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
measures to be adopted to avoid such replacement.		years, the barrier for replacement of the CFL distributed under the project activity with a hypothetically more energy-saving CFL is tremendous. Reason being that the benefit of using a hypothetically more energy-efficient CFL are marginal (already electricity consumption has been decreased by 80%) while the investment for a new CFL will be considerable for low-income households. In conclusion, the distribution of a 15,000-hour CFL is itself the measure by OSRAM India to avoid replacement by any other type of CFL. OSRAM India has intentionally chosen the CFL with the longest lifetime in its product portfolio because OSRAM India has an inherent interest of the CFL distributed being used in the household for ten years. If CFLs distributed are not used anymore, OSRAM India will face a considerable reduction in CER generation – cross-check (see rules and procedures in PDD section B.7.2).	stantial benefits in terms of cost saving by consumers on electricity bills by using energy efficient CFL, it is less likely that CFLs distributed in the project activity would be replaced by more efficient ones.
Clarification Request No. 7. Please provide information on training needs identified for implementation of various stages of the project activity especially distribution of CFLs and collection of GLS bulbs, data recording during distribution process, data compilation, destruction and disposal of collected GLS bulbs, data collection during monitoring from project sample	A.4.2.10	The training plans for the various steps in the project implementation and operation have been developed and confidentially handed to TÜV SÜD.. • Distribution (VP Annex 7) • Meter installation (VP Annex 8) • Cross-check (VP Annex 9)	☑ Detailed training plan with training structure for distribution teams, meter installation teams and teams that would carry out cross-check has been submitted. Number of required team members in each phase has been estimated. Aspects to be covered by trainers in these trainings

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
and cross-check groups etc. Further provide evidence of training plan to fulfil the identified training needs.		For the destruction and disposal of GLS bulbs see PDD section B.7.2 and D.2.	have been defined, which would ensure successful implementation of the project activity. Distribution team members would be trained to ensure collection of replaced GLS bulb, which would then be destroyed centrally under supervision of independent agency. The scarp will be disposed off in co-ordination with APEPDCL.
Corrective Action Request No.4. Please provide the schedule for implementation of project activity in the PDD.	A.4.2.11	The time schedule for project implementation has been developed and included in the PDD. See PDD section A.2.	☑ Project implementation schedule is clearly defined in the PDD.
Clarification Request No. 8. Please provide information on project financing plan.	A.4.4.1	An official document stating the overall project costs and its financing has been handed over to the TÜV by OSRAM.	☑ The project financing plan indicating the total cost of the project has been submitted to the audit team. Total costs of the project would be borne by Osram Germany.
Corrective Action Request No.5. PDD should provide in section A.4.5, details of other similar projects being developed by project participants in different parts of India.	A.4.5.1	The project participants are currently undertaking other similar project activities in the district of Yamunanagar & Sonepat in the State Haryana. See PDD section A.4.5.	☑ Project participants would have an application to register another small scale CDM project activity, in same category and technology/measure but project boundary is distant apart by several hundred kilometres lying in different state.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Corrective Action Request No.6. The energy saving corresponding to the emission reductions mentioned in the PDD is within 60 GWh_e as required for small scale project activities using Type II methodologies. However, based on information available from APEPDCL and sample households visited by the audit team it seems that number of households to be covered, number of bulbs that are anticipated to be replaced, average utilisation hours of bulbs and wattage of bulbs anticipated to be replaced as mentioned in PDD are not representing the correct figures. These figures should be reworked and then it should be proved that energy savings from the project activity would not exceed 60 GWh_e per year.	B.2.1.3	New figures based on a pre-study have been provided in the PDD. See PDD sections A.2 B.2 and B.6.3. For further information regarding the pre-study results see VP Annex 2 and 3. Both documents are confidential. The information regarding the proof of not exceeding the 60 GWh/a is provided in the PDD section B.2 and A.4.3.	☑ The total number of households participating is approximately 700,000. Majority of GLS bulbs to be replaced will be 60W (approximately 90%). This could be established from the pre-study conducted by Osram. The average utilisation hours based on pre-study are estimated to be 3.5 hours per day however, as per information available from The Energy & Resource Institute (2007): Handbook for franchise development in the rural electricity distribution sector (page 25), TERI Press, New Delhi, India, 2007, ISBN 81-7993-113-7, the average utilisation hours for an incandescent lamp in India are 5 per day. The data from TERI study has been used to estimate the baseline emissions and project emissions at validation stage. The actual utilisation hours for baseline case (incandescent lamps) will be monitored after project validation in sample households to arrive at baseline emissions. The actual utilisation hours for project case (CFL) will also be monitored after project registration in sample households to arrive at project emissions. Usage of

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			higher utilisation hours to estimate the baseline and project emissions at validation would ensure that project activity would remain under limits of small scale during crediting period. The maximum energy savings anticipated from the project activity are 53.44 GWh_{elec}/annum based on assumptions mentioned above. This is sufficiently below the limit of 60 GWh_{elec}/annum for Type II small scale project activities. Further as per guidance by EB-42, the distribution of CFL lamps would be limited to only one lamp per household.
Corrective Action Request No.7. The distinct geographical boundary of Visakhapatnam should be clearly documented in PDD using GPS data.	B.3.1	The project activity will cover the whole district of Visakhapatnam. See PDD Section A.2, B.2 and B.3 for further information. Evidence that project activity covers the whole district of Visakhapatnam (see PDD Enclosure 1 “Database households Visakhapatnam”). Therefore it has been agreed that no GPS data is necessary.	☑ It is understood that it would not be feasible to define the geographical co-ordinates of the project boundary, which is entire district of Visakhapatnam however, geographical boundary of district is clearly available in the PDD. It is ensured that project activity would cover the entire district of Visakhapatnam. The complete list of households in Visakhapatnam, which are connected to grid and are registered

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			customer of APEPDCL (the only distribution company in the area) has been obtained from APEPDCL. The total number of households available from this list would be participating in the project activity.
Clarification Request No. 9. Please clarify why autonomous replacement of inefficient bulbs with more efficient light bulbs over the crediting period has not been considered as a baseline scenario.	B.4.1	Those households cannot afford to switch from their incandescent lamps to CFL as the price of CFLs compared to an incandescent lamp is around ten times higher. This is evidenced by the extremely low penetration of CFLs in the households found in the pre-study. In the randomly selected pre-study of 200 households in the district of Visakhapatnam it was found that out of 698 lamps only 6,9 % were CFLs. See PDD section B.4 and VP Annex 2 (confidential).	Response by audit team It is not justified to say that it is unaffordable to switch from incandescent lamps to CFLs given the fact 7% of the bulbs in pre-study were CFLs. This percentage could have increased over the 10 year crediting period. It needs to be justified as to how this aspect would be considered in baseline emission calculations. Response by project proponent The justification has been provided in the PDD section A 4.2. “CFL lamps have been introduced in India already in the early 90s. Even 15 years after introduction, the penetration rate is still very low especially for residential use. In the pre-study conducted in the project area, only less than 7 % of all lamps found were CFLs. The penetration rate has increased to this level as costs for CFLs have decreased over

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			the years. Recently, the price for CFLs in India range between Rs 40 for no branded Chinese lamps to Rs 100 for branded quality lamps. The very low price level however is commonly combined with a very low quality level where the early failure rate of lamps is so high that disappointed customers are returning to purchase GLS bulbs. The prices for CFLs have reached such a low price level that no further major reduction of costs can be expected in the near future as costs for material (metals, etc.), energy and labour are recently increasing. As price and good reputation of the product is the key factor for the usage of CFLs in residential homes, therefore a significant increase in CFL penetration over the crediting period is not to expect." Final response by audit team ☑ Audit agrees that lowering of prices is prime mover for consumers to adopt CFL. The prices in India are already quite low and further reduction is not anticipated. Given this background, it unlikely that consum-

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			ers participating in the project would have shifted to CFL during the crediting period without project activity.
Clarification Request No. 10. Please clarify how the impact of regulatory requirements for use of CFLs in the host country or region, implemented during crediting period, will be taken into consideration.	B.4.2	Following the E+/E- rule of the CDM EB (EB 16, Annex 3; EB 22; Annex 3), we only take regulatory requirements for use of CFLs into account that were implemented before Marrakech Accords (2001). We have checked and there were no regulatory requirements on CFLS before Marrakech Accords.	☑ From Annex 3 to EB22 (clarification on consideration of national and/or sectoral policies and circumstances in baseline scenarios, version 2) it is understood that national and/or sectoral policies or **regulations** that give comparative advantages to less emissions-intensive technologies and implemented after 11 November 2001 need not be taken into account in developing baseline scenario.
Clarification Request No. 11. As per the discussions held with the senior officials of APEPDCL it is understood that for any household applying for a load increase, it is mandatory to use efficient light bulbs and they cannot use GLS bulbs. How is this regulatory requirement taken into consideration in identification of baseline scenario?	B.4.3	Following the E+/E- rule of the CDM EB (EB 16, Annex 3; EB 22; Annex 3), we only take regulatory requirements for use of CFLs into account that were implemented before Marrakech Accords (2001). We have checked and there were no regulatory requirements on CFLS before Marrakech Accords.	☑ From Annex 3 to EB22 (clarification on consideration of national and/or sectoral policies and circumstances in baseline scenarios, version 2) it is understood that national and/or sectoral policies or **regulations** that give comparative advantages to less emissions-intensive technologies and implemented after 11 November 2001 need not be taken into account in developing baseline scenario.
Clarification Request No. 12. Please provide evidence to prove that incen-	B.5.13	The project participant has provided MoU with the utility that specified that the CFL	☑ The signed copy of MoU between

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
tive from the CDM was seriously considered in the decision to proceed with the project activity.		distribution projects need to be developed under CDM. See VP Annex 1 (confidential).	Osram and APEPDCL has been submitted to audit team. The MoU states that the CFL distribution project at Visakhapatnam would be jointly developed by Osram and APEPDCL as a CDM project. It is evident that CDM has been seriously considered by Osram in decision to implement the project activity.
Clarification Request No. 13. Please provide documentary evidence for fee that will be charged from households to whom CFLs would be distributed, cost of CFLs, fixed costs and other costs anticipated in the implementation of project activity.	B.5.15	It is not clear yet whether a fee for the CFL will be charged. In case a fee is charged, it would not be higher than 15 Indian Rupien (approx. 0.26 EUR). For reasons of conservativeness, in the cost and revenue calculation depicted in PDD section B.5 the maximum fee is included as revenue. It can be seen, that even with this fee, the additionality of the project is clearly shown. The documents and information regarding all mentioned cost components (specific production costs of CFL and other project costs including freight-, assembly- and distribution costs have been confidentially shown to the TÜV Süd in transparent manner. For the bandwidths see also PDD section B.5.	Response by audit team Per unit cost for production of CFL and per unit cost for distribution of CFL has been checked by audit team with finance department of Osram. It can be confirmed that actual cost for production and distribution per CFL are within the range indicated in the PDD. The lower values for per unit cost of production and distribution of CFL has been used in NPV analysis, which is deemed conservative. As per the project implementation plan, the CFLs will be distributed to households by Osram in collaboration with APEPDCL. As per discussions with APEPDCL officials it is understood that they do not intend to charge any money from the house-

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			holds (customers of APEPDCL) for the CFL distributed by Osram. But given bureaucratic situation it might not be possible to distribute CFLs free of cost. Hence APEPDCL might charge a token money of upto INR 15 from households and pass on the revenue to Osram. The project activity without CDM only generates revenues from sales of CFL in the first year hence the discount rate considered in NPV calculation does not create any impact in the NPV calculations. It is clearly established that project has high negative NPV without revenues from CFL. Issues to be clarified: 1. Please do the sensitivity analysis for NPV calculations 2. Please provide justification for discount rate of 7%. 3. Please provide excel sheet for NPV calculation. <u>Response by project proponent</u> The sensitivity analysis for NPV has been done and included in the PDD. For reasons of conservativeness, a discount rate of 0 % is used. The

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			excel sheet for NPV calculation has been provided to the TÜV. Final response by audit team ☑ The project activity is clearly unattractive without revenues from CDM.
Corrective Action Request No.8. The formula for calculating the total power rating of CFLs in the project activity as used in excel calculation tool is not same as that defined in the methodology. Please revise.	B.6.1.3	The tool has been modified and wattage per CFL will be recorded. All information has been provided. See PDD B 6.1 and B 6.3	☑ The power rating of CFLs to be used in the project activity is now calculated as weighted average of wattage for estimation of emission reductions during validation. However, for calculation of emission reductions during verification, wattage of each CFL distributed would be used directly.
Corrective Action Request No.9. The PDD says that average operating hours of the sample household monitored will be used for calculating energy consumed in the project activity however, the excel calculation tool adjusts the operating hour data for the margin of error at 95% confidence interval as required by guidance from CDM EB. This approach is conservative and should be defined transparently in the PDD giving formula for calculation of mean and standard deviation also. All the values of parameters used should be stated in the PDD.	B.6.1.3	The average operating hours of the sample groups (baseline and spot-check) will be adjusted with a 95 % confidence interval and z = 1,96. All formula and statistical methods including mean and standard deviation are described in transparent manner in PDD sections B.6.1, B.6.3 and B.7.1. For the verification of the statistical methods, see also VP Annex 10.	☑ PDD in section B.6.1 now clearly defines the equation for baseline and project emission calculations. Equations adjust statistically significant variables at 95% confidence level.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Corrective Action Request No.10. Standard normal for a confidence level of 95% 'z' should be used in the formula for calculating project energy consumption.	B.6.1.3	Standard normal for a confidence level of 95% 'z' is used in the formula for calculating the project energy consumption. All information has been provided in transparent manner in the PDD section B.6.1 See also VP Annex 10 for further information regarding the statistical methods.	☑ Standard normal for confidence level of 95%, z=1.96 has been used in the revised calculations. This is deemed correct.
Corrective Action Request No.11. The project envisages to use data of operating hours as monitored in 'project sample groups' (PSG) for both baseline and project energy calculation. This approach is not in line with methodology. In absence of 'baseline sample groups' (BSG), the operating hours to be used for baseline energy consumption should be fixed ex-ante based on sampling conducted over statistically representative households. This data should be presented in section B.6.2 of the PDD.	B.6.1.4	A separate baseline study will be conducted where operating hours of GLS bulbs in the district of Visakhapatnam will be metered and monitored. A sample of about 200 households will be randomly selected. These households, in case they have a GLS that would be eligible to be replaced in the project and in case the households agree to participate, will have a meter installed. The baseline study will be conducted for at least 1 month. To get an annual average, seasonal differences of the metered data will be taken into account by adjusting each daily measure with a daylight adjustment factor. The baseline measurement for the baseline operating hours will be undertaken after validation. (see project implementation plan in PDD section B 7.2) This approach to apply the baseline after validation is already common practice in the methodology AM0034.	☑ Project activity plans to conduct a baseline study for a period of atleast one month in sample households to monitor the utilisation hours for GLS lamps used in these households. This study would be conducted at later stage after validation of the project activity. The data derived from this study would be checked during verification. This study would be conducted for atleast one month to arrive at average daily utilisation hours per day. However, monthly daylight adjustment factor would be applied to monitored data to make it representative for the whole year. Monthly daily adjustment factors are presented in Enclosure 3 to the PDD. Monthly dawn and dusk time

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		All information regarding the baseline has been provided in transparent manner in the PDD sections B.4, B 6.1, B 6.2 and B 7.2.	data has been obtained from http://www.gaisma.com/en/ Based on this data daily hours of darkness have been arrived. Further, depending on mean number of rainy days in each month, additional darkness hours per day in a month have been derived. So daily potential lighting hours are derived as sum of above two factors. Monthly daylight adjustment factor ($\alpha_{daylight}$) is then derived as ratio of potential lighting hours in that month and annual average of potential lighting hours. This factor is higher in months where daily hours of darkness are less and is less in months where daily hours of darkness are more. Hence it helps to level out the monitored data for baseline operating hours for one particular month over the whole year. Further following EB-42, The baseline would be monitored for 90 days as proposed in the PP response for request for review.
Clarification Request No. 14. The project activity implementation plan should be described in the PDD, which should mention as to how it would be en-	B.6.1.5	The project implementation plan is included in PDD section B 7.2. It mentions the destruction of GLS. The decentralized collection of GLS will be	☑ From the implementation plan it is understood that distribution team members would be trained to ensure

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
sured that all the GLS bulbs collected would be destroyed to avoid there usage at some other place. In case all replaced GLS bulbs are not collected and destroyed then how will the leakage be estimated.		done during distribution by the distribution team. The absolute numbers will be recorded and monitored. At decentralise level the GLS will be destroyed under supervision of an independent body. For further details see also PDD section B 7.2 under subsection 3. Distribution. The leakage will be calculated as described in transparent manner in PDD section B.6.1.	collection of replaced GLS bulb, which would then be destroyed centrally under supervision of independent agency. The scarp will be disposed off in co-ordination with APEPDCL. PDD also provides formulae for calculation of leakage in case all the GLS replaced in the project activity are not scrapped. The formula is deemed appropriate.
Corrective Action Request No.12. Please clarify if project activity intends to use ex-ante or ex-post grid emission factor value.	B.6.2.2.2	The project activity will use ex-ante grid emission factor value. See PDD section B 6.1 (Step 4), B 6.3 and B 6.2.	Response by audit team Use the latest factor available from CEA website. Also mention if the factor used is weighted average or combined margin factor. Response by project proponent The emission factor used is the Combined Margin (incl. Imports) published by the Central Electricity Authority (CEA). New CER calculation based on the latest available factor from CEA webpage has been done and included in the PDD. Final response by audit team ☑ Recently in December 2007, Central Electricity Authority (CEA) has published version 3.0 of the grid emis-

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			sion factor data for all regional grids in India based on latest grid data available until 2006-2007. The emission factor for southern region grid has been determined to be 850.00 tCO_2/GWh. The PDD has been revised and the emission factor available from CEA has been directly used to calculate the emission reductions. It is deemed acceptable to use the most recent data available from CEA, which has been widely accepted by DOEs and CDM EB.
Corrective Action Request No.13. The PDD should clearly define the procedure to arrive at the wattage of CFLs that will be used for calculating the project energy consumption during monitoring.	B.6.3.1	For calculating the project energy consumption all project CFLs distributed will be recorded in the database including the wattage. The database will count all CFL wattages and calculates the average of CFL. This average wattage will then be used for the calculation of the project energy consumption See also PDD sections B.6.1, B.7.1 and B 7.2 (sub-section 3 – Distribution) as well as VP Annex 12 (confidential) for further information.	☑ Wattage of each CFL distributed in the project activity would be recorded. The monitored data for operating hours would be then multiplied with sum of wattage of all CFLs to arrive at project's energy consumption.
Corrective Action Request No.14. The PDD should define how baseline and project energy data will be adjusted in case project CFL is found missing or not working or replaced with other bulb during sampling in PSG and project cross-check group	B.6.3.1	CFLs not functioning anymore will be monitored in cross-check groups during the project for each monitoring period. At least 200 CFLs will be randomly selected and checked. This number will be compared with the number of CFL that do not function any	☑ During validation, emission reductions have been estimated by applying correction factor based on assumption that 1% CFLs would be damaged per year due to household

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
(PCCG). What is the basis for assuming that every year 1% CFLs will be out of order? Will this factor be used during actual monitoring also?		more. As a result, the percentage of missing or not working CFLs will reduce the CERs by the same percentage. The 1% decrease in CFL population is a mere assumption. In the new emission reduction calculation in the actual monitoring report the estimate is based on the real data of CFL burn-out rates received from the cross-check. For more detailed information and procedure see PDD sections B.6.1, B.6.3 and B.7.2. For the statistical correction methods used see also VP Annex 10.	behaviour and then CFLs would also become non-functional due to life-time aspect. During verification cross-check will be carried out in sample households and based on CFLs that are found missing or not operating, adjustment (CF_v) would be made to emission reductions.
Corrective Action Request No.15. The PDD should provide an extract of database that would be used to compile the entire project data including number of bulbs replaced, wattage of bulbs replaced, number of CFLs installed, wattage of CFLs installed, address of household where CFLs installed, date when GLS replaced with CFL in particular household, list of PSG households, data to be collected during spot check and cross check etc.	B.7.1.2.1	An extract of project database is provided to demonstrate the main functions and features of the project database used throughout the project. It also shows the CER-estimation for the PDD as well as the calculation scheme for the verification, including all necessary information required (see VP Annex 12 (confidential). For more information regarding the formulae for the emission reduction and the monitoring procedure see also PDD section B.6.1 and B 7.2 respectively.	☑
Clarification Request No. 15. Please clarify as to how the power rating of replaced GLS bulb will be recorded. If it is based on nameplate data then what will be done in case there is no wattage labelling on	B.7.1.2.3	The power rating of replaced GLS bulbs will be recorded immediately while replacement is taking place on the distribution form that will be filled in for each household by the distribution teams. The power rating is generally written on the bulb. In case there is no	☑ It is deemed appropriate to record the GLS bulb as 60W in case nameplate data is not available since most of the bulbs in pre-study have

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
the bulb.		nameplate data, the replaced GLS will be recorded as 60 W. The project only replaces 60 W or 100 W GLS. The pre-study results show, that the majority of GLS found are 60 W. See pre-study results described in PDD section B 2. For further information see also VP Annex 2 (confidential).	been found to be 60W. Moreover people generally use 60W or higher wattage bulbs in living rooms, bedrooms, kitchens (areas with higher utilisation hours) etc. Hence chance of recording higher wattage in place of lower wattage is low.
Clarification Request No. 16. Please clarify as to how the PSG will be selected is statistically representative manner and define the households to be included in this group.	B.7.1.2.5	The project sample groups will be selected randomly out of the whole database of households eligible to participate in the project. By choosing randomly, using a certain number of samples, that is higher than the minimum number of samples to be statistically correct and by adjusting the results with appropriate statistical correction methods in a conservative way, representativeness is assured. For further information about the statistical methods used see VP Annex 10 (confidential).	☑ Simple random sampling will be done from total database of households to arrive at project sample group, which is deemed appropriate. Stratified random sampling cannot be done for the total project area because the population in project area is heterogeneous but it is difficult to isolate homogeneous population from total population. There are different kind of people with different income and different energy consumption pattern. Multistage random sampling as defined in AM0046 is also not feasible for this total project area since urban and rural population is mixed and it is difficult to draw out smaller project areas.
Corrective Action Request No.16. PDD should provide the details of metering	B.7.1.2.5	The detailed information regarding the metering equipment has been provided to TÜV	☑ Specification of the metering equip-

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
equipment to be used for measuring operating hours. It should include the monitoring procedure, its accuracy, required calibration frequency. PDD should also mention the frequency of data recording from this meter.		SÜD. For further information regarding the meter equipment to be used in the project, see PDD Annex 4 (meter information). The mathematical principle of the monitoring is also provided in PDD section B.6.1 and a more conceptional description in B.7.2.	ment to be used for measurement of operating hours has been clearly defined in Annex 4 of the PDD. The metering device to be used in the project activity starts to record data (operating time) every 15 seconds in its memory as soon as light bulb is switched on. Every time the light bulb is switched on or if light bulb is continuously switched on for 4 hours, the metering device relays the stored data wirelessly to central server where data from each meter is recorded and saved. This procedure would ensure that 100% data is measured.
Corrective Action Request No.17. The PDD should establish the procedure for conducting cross-check in non-metered households as required by the methodology. It should also mention the data that will be captured during this cross check and how will it be utilised in calculation of emission reductions during verification.	B.7.1.2.7	The procedure of conducting the cross-check is provided in transparent manner especially in PDD section B 7.2 (sub-section 6 – Cross-check) but also in PDD sections B 6.1, B 6.3 and B 7.1.	☑ PDD now clearly defines the procedure to carry out cross-checks in non-metered households. During verification, cross-checks will be carried out in sample households (not monitored) and based on CFLs that are found missing or not operating, adjustment (CF_v) would be made to emission reductions. Calculation for factor CF_v is clearly defined in section B.6.1 of the PDD.
Corrective Action Request No.18. The project implementation plan should be	B.7.2.1	The project implementation plan is included in PDD section B 7.2 (sub-section 1). It	☑

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
attached to the PDD. It should clearly indicate the responsibilities of different parties in various stages of project implementation viz. planning, CFL distribution, data collection, data compilation, waste handling, data monitoring etc.		clearly indicates the responsibilities of all involved bodies during project implementation and planning.	The detailed project implementation plan highlighting the steps in implementation, party responsible for action and party supervising the process has been provided in the PDD. The plan is deemed appropriate to facilitate successful implementation of the project activity.
Corrective Action Request No.19. It should be mentioned in section B.8 of the PDD if Perspectives Climate Change GmbH is also project participant and contact details should be provided.	B.8.1.5	Perspectives GmbH is not project participant. All information has been provided. See PDD section B.8.	☑
Corrective Action Request No.20. The starting date of the project activity should be mentioned as earlier date of start of implementation or real action.	C.1.1	The starting date of the project activity is the date when the MoU with Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL) was signed (08.05.2007). See PDD section C.1.1 and VP Annex 1 (The document itself is confidential).	☑ The signing of MoU on 8 May 2007 can be considered as start of project activity.
Clarification Request No. 17. Please clarify if project participants plan to start the crediting period after distribution of CFLs in the total project area.	C.2.2	The crediting period will start at date of start of distribution of CFLs. For further information see PDD section A 2 and B 7.2.	☑ Osram plans to start crediting period with start of distribution of CFLs for the project activity, which would be after registration of the project.
Clarification Request No. 18. Please clarify how the waste generated due to destruction of collected GLS bulbs will be	D.2.1	The waste of the destroyed GLS will be handled in an appropriate and environmental friendly way with due care and safety without	☑

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
handled to minimise environmental impacts.		causing any hazard in close coordination with APEPDCL, as specified by local authority. All information has been provided in the PDD section B 7.2 (sub-section 3) and D 2.	
Clarification Request No. 19. Please provide a confirmation that no ODA funding is involved in the project activity.	F.2.2	The document regarding the financing of the project confidentially provided by OSRAM to TÜV SÜD conforms that no ODA funding is used in the project.	☑ The project financing plan indicating the total cost of the project has been submitted to the audit team. Total costs of the project would be borne by Osram Germany.

Table 3 Unresolved Corrective Action and Clarification Requests (in case of denials)

Clarifications and / or corrective action requests by validation team	Id. of CAR/CR	Explanation of Conclusion for Denial
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Industrie Service

Annex 2: Information Reference List

Reference No.	Document or Type of Information
1.	Project Design Document for CDM project "Visakhapatnam (India) OSRAM CFL distribution CDM Project", dated 23 August 2007, version 1.0, submitted on 28 August 2007
2.	Demand-side energy efficiency activities for specific technologies , AMS II.C, version 09
3.	On-site interviews and inspection at the office conducted 20-21 September, 2007 by validators of TÜV SÜD. Validation team: Abhishek Goyal TÜV SÜD Industrie Service GmbH Sergio Degener TÜV SÜD Industrie Service GmbH Praveen Pyata TÜV SÜD South Asia Interviewed persons: Mr. Boris Bronger Osram GmbH Mr. Gagan Mehra Osram India Pvt. Ltd. Mr. Chandan Bhattacharjee Osram India Pvt. Ltd. Mr. Sanjeev Raje Osram India Pvt. Ltd Mr. Matthias Krey Perspectives GmbH Mr. Marc Andre Marry Perspectives GmbH Mr. Lav Agarwal A.P. Eastern Power Distribution Co. Ltd. Mr. B. Ramesh Prasad A.P. Eastern Power Distribution Co. Ltd.
4.	Data of household connections in Visakhapatnam, submitted 24 January 2008
5.	Technical data for CFL exchange with GSL lamps, submitted 24 January 2008
6.	Procedure for seasonal daylight adjustment for baseline, submitted 24 January 2008
7.	MoU signed between Osram and APEPDCL, dated 8 May 2007, submitted 24 January 2008
8.	Results of pre-study conducted in Visakhapatnam, submitted 24 January 2008
9.	Order documents for release of requisite number of lamp parts from Osram GmbH to Osram India, dated 21 November 2007, submitted 24 January 2008
10.	Material specification for mercury content of CFL, submitted 24 January 2008

Reference No.	Document or Type of Information
11.	Training concept for distribution-Osram CDM projects , submitted 24 January 2008
12.	Training concept for meter installation-Osram CDM projects , submitted 24 January 2008
13.	Training concept for cross checks during verification-Osram CDM projects , submitted 24 January 2008
14.	Verification on appropriate sampling method for Osram CDM CFL projects based on SACHS,L/HEDDERICH,J: Angewandte Statistik – Methodensammlung mit R, 12. Aufl., 2006 and PAPULA, L: Mathematik für Ingenieure und Naturwissenschaftler, Bd. 3, 2. Aufl., 1997, submitted 24 January 2008
15.	Project implementation plan , submitted 24 January 2008
16.	Data sheet for metering equipment, submitted 24 January 2008
17.	Extract of project database, submitted 24 January 2008
18.	Excel calculation for estimation of emission reductions and investment analysis, submitted 24 January 2008
19.	Letter of Approval from India, dated 22 January 2008, submitted 24 January 2008
20.	Project financing plan, submitted 24 January 2008
21.	List of participants in local stakeholder consultation meeting and minutes, dated 25 May 2007, submitted 21 September 2007
22.	Project Design Document for CDM project "Visakhapatnam (India) OSRAM CFL distribution CDM Project", dated 10 December 2007, version 4, submitted on 25 February 2008
23.	Project Design Document for CDM project "Visakhapatnam (India) OSRAM CFL distribution CDM Project", dated 24 July 2008, ver 5
24.	Reports of internal tests conducted by Osram on the CFL lamps, submitted 24 July 2008
25.	Project Design Document for CDM project "Visakhapatnam (India) OSRAM CFL distribution CDM Project", dated 3rd Feb 2009, ver 6, submitted 6th Feb 2009
26.	Basic principles of emission reduction calculations, submitted 6th Feb 2009
27.	Pre-study for Visakhapatnam – procedures and results, submitted 6th Feb 2009
28.	IRR and NPV calculation sheet for Visakhapatnam project, submitted 6th Feb 2009