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# VALIDATION REPORT

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## INDIA- FAL-G BRICK AND BLOCKS PROJECT NO. 1, IN INDIA

REPORT No.2006-1610

REVISION No. 01

DET NORSKE VERITAS



## VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: World Bank Carbon Finance Unit.	Client ref.: Mr. Warren Evans.

## Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “India- FaL-G Brick and Blocks Project No.1” in India on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

The validation consists of the following three phases: I) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV’s opinion that the project, as described in the revised project design document of 28<sup>th</sup> August 2006, meets all relevant UNFCCC requirements for the CDM is eligible as category II.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-II.D, version 07. Hence, DNV requests the registration of the “India-FaL-G Brick and Blocks Project No.1” as a CDM project activity.

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[Appendix A Validation Protocol](#)

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDCF	Community Development Carbon Fund.
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ECPL	Eco-Carbon Private Limited
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
INSWAREB	Institute of Solid Waste Research and Ecological Balance.
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OPC	Ordinary Portland Cement
PDD	Project Design Document
WBCFU	World Bank Carbon Finance Unit
UNFCCC	United Nations Framework Convention on Climate Change



## 1 INTRODUCTION

The World Bank Carbon Finance Unit has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform validation of the “India-FaL-G Bricks and Blocks Project No 1” (hereafter called “the project”) in India. This report summarises findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr Amit Thusu	DNV, India	GHG auditor
Mr C. Kumaraswamy	DNV, India	GHG Auditor, Sector expert
Mr Venkata Raman K	DNV, India	Technical reviewer

### 1.1 Validation Objective

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

### 1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the simplified CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board. The validation team has, based on the recommendations in the Validation and Verification Manual /4/, employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

### 1.3 Description of Proposed CDM Project

The project involves the establishment of fourteen small scale brick manufacturing units based on fly ash, lime/OPC and gypsum (FaL-G) technology in the state of Andhra Pradesh in India. The FaL-G technology differs from the conventional brick making technology in the selection of raw materials (fly ash, lime/OPC and gypsum) and the elimination of the sintering part of the conventional brick making process. The technology thus reduces the anthropogenic GHG emissions by totally displacing fossil fuel in the drying and curing process of the bricks. The project was commissioned in January 2003. The technology used in the project is indigenously developed.



The project is expected to result in emission reductions of 14162 tonnes of CO<sub>2</sub> per year during the ten years of crediting period.

## 2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design and the baseline and monitoring methodology
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /4/. The protocol shows in transparent manner criteria (requirements), means of verification 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 Figure 1.

The completed draft validation protocol of the “India-FaL-G Brick and Blocks Project No.1” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.

**Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities**

<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided ( <b>OK</b> ), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

**Validation Protocol Table 2: Requirement Checklist**

<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	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.	This is either acceptable based on evidence provided ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the validation team has identified a need for further clarification.

**Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification**

<b>Draft report corrective action requests and requests for clarifications</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
If the conclusions from the draft Validation are either a <b>Corrective Action Request</b> or a <b>Clarification Request</b> , these should be listed in this section.	Reference to the checklist question number in Table 2 where the <b>Corrective Action Request</b> or <b>Clarification Request</b> is explained.	The responses given by the 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 2, under "Final Conclusion".

**Figure 1 Validation protocol tables**



## 2.1 Review of Documents

The PDD /1/ version 1 and the and latest version 03 dated 28/08/2006 submitted by the World Bank Carbon Finance Unit and additional background documents related to the project design and baseline, like the emission reduction calculations worksheet, documents relating to the baseline energy consumption, market patterns and the environmental and social review document were assessed as a part of validation.

## 2.2 Follow-up Interviews

During May 2006, DNV Certification performed interviews with representatives of Eco-Carbon Private Limited, to resolve issues identified during the document review. The main topics of the interviews are summarised in Table 1 Interview topics

**Table 1 Interview topics**

Interviewed organisation	Interview topics
Eco-Carbon Private Limited	<ul style="list-style-type: none"> <li>➤ Additionality.</li> <li>➤ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations.</li> <li>➤ Resources, training needs</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participants in DNV's draft validation report were resolved during communications between the client and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

## 3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation dated 28<sup>th</sup> August 2006.

### 3.1 Participation Requirements

The project activity is being proposed by Eco Carbon Private Limited (ECPL), which is the only project participant from India. The host Party India meets all participation requirements, and the DNA of India accorded the letter of approval for the project on 26<sup>th</sup> July 2006 /2/ and has also provided confirmation that the project assists in achieving sustainable development.

The Government of Italy, an Annex-1 country project participant, has approved and authorised, with its letter of approval ref 3118/RSA/2006 /2/ the voluntary participation of the International





Bank for Reconstruction and Development as trustee for the Community Development Carbon Fund (CDCF), a trust fund maintained by the World Bank as a project participant. Italy ratified the Kyoto protocol on 31<sup>st</sup> May 2002.

The Government of Netherlands, also an Annex-1 country project participant, has approved and authorised with its letter of approval ref IZ/2006279141 dated 30<sup>th</sup> June 2006 /3/ the voluntary participation of the International Bank for Reconstruction and Development as trustee for the Community Development Carbon Fund (CDCF), a trust fund maintained by the World Bank as a project participant. Netherlands ratified the Kyoto protocol on 31<sup>st</sup> May 2002.

### 3.2 Project Design

The project involves the establishment of fourteen small scale brick manufacturing units based on fly ash, lime/OPC and gypsum (FaL-G) technology. The FaL-G technology differs from the conventional brick making technology in the selection of raw materials (fly ash, lime/OPC and gypsum) and also in the drying and curing process. The technology makes use of the chemical reaction (between lime and gypsum) and the bonding strength derived from this to completely eliminate the conventional drying and curing step, which forms an essential and energy consuming part of the conventional brick manufacturing process. The technology is indigenously developed.

The project activity started on 01/01/2003. The expected operational lifetime of the project is estimated around 15 years and a fixed crediting period of 10 years has been chosen with the starting date of 01/04/2004.

Even though the PDD for the project was prepared and offered for validation after 31st December 2005, the project can be considered as a prompt start project based on the COP/MOP decision that "project activities that started in the period between 1 January 2000 and 18 November 2004 and have not yet requested registration but have either submitted a new methodology or have requested validation by a designated operational entity by 31 December 2005 can request retroactive credits if they are registered by the Executive Board by 31 December 2006 at the latest". DNV can confirm that the project proponent had requested for a new methodology for the project activity in 2005 and was advised by the Small Scale Working Group on Methodology with the submission number SSC\_014. The letter forms a part of the PDD.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

### 3.3 Project Baseline

Since the project activity is aimed at energy efficiency and the total energy savings per year (at 43.73 GWh<sub>Th</sub>) is less than the threshold energy savings of 45 GWh<sub>Th</sub>, as specified by the AMS II D category, the project is eligible as type II.D small-scale CDM project activity and can apply a simplified baseline methodology.

The energy baseline as per the methodology is the facility that would otherwise be built in case of a new facility, or the energy use of the existing equipment that is replaced in case of a retrofit. The project activity replaces the conventional technologies of brick manufacture (i.e the traditional clamps, high draft brick kiln (HDK), fixed chimney bull trench kilns (FCBTK) and



the vertical shaft brick kiln (VSBK), with the FaL-G technology of bricks manufacture. The selected baseline scenario that, in the absence of the project activity, clamps technology would have been used for bricks manufacture is well substantiated with statistics culled from the article (Emission standards for brick kilns-An opportunity for technology up gradation) published by the Tata Energy Research Institute (TERI) on the production capacities and the number of production plants.

The specific energy consumption for the baseline scenario has been estimated as the weighted average energy consumption for clay bricks production by the different processes and has been arrived at 0.00261 TJ/m<sup>3</sup> brick. The method and the data used and its sources have been verified and are deemed justified.

The project also considers the use of 5% biomass in the conventional bricks manufacturing process. This figure is considered to be conservative as the documented literature (Regional wood energy development programme in Asia published by Food and Agriculture Organisation of the United Nation) put the use of biomass at about 2%.

### 3.4 Additionality

As per the Attachment A to Appendix B of simplified modalities and procedures for small-scale CDM project activities, the project demonstrates additionality through the existence of the prevailing practice and other barriers.

The additionality of the project is argued on the barriers of prevailing practice, technological and market acceptance.

The prevailing practice barrier has been demonstrated by the market share of the conventionally manufactured clay bricks which constitutes about 95%, in comparison to the market share of 1.4% of the fly ash bricks (which include the FaL-G technology bricks). DNV could confirm this through the report on "Technical and Financial due-diligence for the FaL-G program" prepared for the World Bank.

All the 14 units in the bundle follow the fly-ash, lime/OPC and gypsum approach for the manufacturing of bricks and blocks. The three main raw materials of the process are fly ash, lime/OPC and gypsum and the strength of the product depends on the purity and the mixing proportions of these materials. The sourcing and purchase of the raw materials operating within the right proportions of the raw materials to get the correct bonding chemistry are the technological risks of the project. These risks are well justified.

In spite of the FaL-G bricks having superior strength (as evidenced by the test certificates) in comparison to the conventional clay bricks, the colour and the presence of fly ash in the bricks creates a low consumer acceptance, which is deemed as a significant barrier.

Based on the above, it is substantiated that the project faces barriers compared to the conventional brick manufacturing process using soil (clay) and the sintering process for drying and curing, and thus is deemed additional.

### 3.5 Monitoring Plan

The selected monitoring methodology is in line with the monitoring methodology AMS-II.D and monitors the following parameters.



- Bricks and blocks production rate / day and on monthly basis
- Dimensions of the bricks and blocks
- Electricity consumption – measured
- Diesel consumption – measured

All the data will be collected by the individual unit owners and report it to the Eco Carbon private Limited, who will archive the data in electronic and paper form for a period of two years after the crediting period.

As stated in the para 3.3 above, the specific energy consumption for the baseline scenario has been estimated as the weighted average energy consumption for clay bricks production by the different processes and has been arrived at 0.00261 TJ/m<sup>3</sup> brick. The method and the data used and the data source been verified and are deemed justified. The project also considers the use of 5% biomass in the conventional bricks manufacturing process.

The project proponent has developed a environmental and social review for the project, which also contains the environmental management plan common for all the units. The unit owners will be responsible for the collection of the data and the project proponent ECPL will be responsible for the archiving it. Periodic audits for the units are also envisaged to ensure compliance.

### 3.6 Calculation of GHG Emissions

The GHG emissions have been calculated as the difference of the baseline emission and the project emissions. The baseline emissions have been calculated as the product of the specific baseline energy consumption and the actual production achieved in the bundle. The project emissions are due to the usage of electricity in the unit. For those units which do not have access to grid electricity, diesel consumption is used for the project emission estimation. The project proponent is considering a grid emission factor of 0.9 t CO<sub>2</sub>/MWh (fixed ex-ante), based on the AMS ID methodology (paragraph 8 for diesel sets).

Even though the combined margin approach using the data of the southern regional grid to which the units are attached is to be considered, the use of the grid emission factor of 0.9 t CO<sub>2</sub>/MWh is deemed conservative as the grid emission factor for the southern regional grid is around 0.834 t CO<sub>2</sub>/MWh (using the combined margin method and data of years 2002-03, 2003-04 and 2004-05).

It is demonstrated that the project emissions due to the transportation of raw materials is negligible and also exist in the baseline scenario of conventional brick manufacturing process for the transportation of the coal and soil. This reasoning is justified.

Since the energy generating equipment is not transferred from another activity and no existing equipment is transferred to another activity, no other leakage need to be considered.

The project is expected to result in emission reductions of 141 623 tonnes of CO<sub>2</sub> during the ten year crediting period.

### 3.7 Environmental Impacts

The environmental impacts of the project have been assessed and documented in the environmental and social review. The project's environmental impacts relate to suspended



particulate matter emanation during the fly ash handling, and the noise levels. The dust emanation problem will be mitigated by water sprinkling and the noise problem by the use of machines with inbuilt noise abatement measures and regular preventive maintenance.

As per the MoEF, an EIA is not required for projects costing less than USD 22 million, which is the case for this project.

### **3.8 Comments by Local Stakeholders**

The project proponent has conducted consultations in workshops with stakeholders which included local residents where the unit are located, raw material suppliers, consumers and the workers. No adverse comments were received from local stakeholders.

## **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

The PDD of version 1 was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://www.dnv.com/certification/climatechange)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 21 April 2006 to 20 May 2006. No comments were received.



## 5 VALIDATION OPINION

*Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “India-FaL-G Bricks and Blocks Project No 1” in Andhra Pradesh, India. The validation is performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.*

*The project participant is Eco Carbon Private Limited (ECPL). The host Party India and the Annex-1 Parties Italy and Netherlands meet all participation requirements. The DNA of India has approved the project.*

*The validation has confirmed that the project is eligible as category II.D small-scale CDM project activity and correctly applies the simplified baseline and monitoring methodology AMS-II.D. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario is reasonable for the selected 10 year crediting period. Moreover, an analysis of the barriers facing the project demonstrates that project is not a likely baseline scenario.*

*The project will contribute to sustainable development by the manufacturing of bricks using the FaL-G technology which uses fly ash, lime and gypsum as the main raw materials and totally eliminates the energy consuming step of sintering and curing in the conventional brick manufacturing process. The project will also provide benefits such as employment generation during for operation of the project, ensuring environmental well being. The DNA of India has confirmed that the project assists in achieving sustainable development and has accorded the approval for the project on 26<sup>th</sup> July 2006.*

*The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards India.*

*The project results in the reduction of GHG emissions those are real, measurable and give long-term benefits and that are additional to what would have occurred in the absence of the project. The project will on average reduce 14162 t CO<sub>2e</sub> per year.*

*The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.*

*A local stake holder consultation process has been carried out by the project participant. DNV published the PDD on the DNV climate change web site and comments by Parties, stakeholders and UNFCCC accredited NGOs were invited through the CDM web site. No comments were received during this period.*

*In summary, it is DNV's opinion that the project, as described in the project design document of 28<sup>th</sup> August 2006 meets all relevant UNFCCC requirements for the CDM, is eligible as category II.D Version 07: 3 March 2006 small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-II.D. Hence, DNV requests the registration of the “India-FaL-G Bricks and Blocks Project No 1” as a CDM project activity.*



## REFERENCES

*Documents provided by the project proponent that relate directly to the project:*

- /1/ PDD version 1 , Version 2 and the latest Version 03 dated 28<sup>th</sup> August 2006 submitted by Eco Carbon Private Limited (ECPL)
- /2/ Host country letter of approval dated 26<sup>th</sup> July 2006. and Letter of approval from Annex-1 country Italy ref no 3118/RSA/2006
- /3/ Letter of Approval from Netherlands dated 30<sup>th</sup> June 2006.

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

- /4/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /5/ CDM EB, *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, AMS-II.D*, Version 07: 3 March 2006.

*Persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above:*

- /6/ Dr. Bhanumathidas, ECPL
- /7/ Dr. N Kalidas, ECPL

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## **APPENDIX A**

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### **VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES**

**Table 1 Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities**

Requirement	Reference	Conclusion	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	Yes	Table 2, Section E.4.1 The project will assist Annex-1 country Italy in achieving compliance.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	<b>CAR-1</b>	Table 2, Section A.3. Written approval from DNA of India is received.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	Yes	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	<b>CAR-1</b>	Written approval from DNA of Italy and India is received.
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	Yes	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	Yes	Table 2, Section B.2.1
7. In case public funding from Parties included in Annex I	Decision 17/CP.7,	Yes	There is no diversion of public funding



Requirement	Reference	Conclusion	Cross Reference/ Comment
is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	CDM Modalities and Procedures Appendix B, § 2		from any Annex-1 country.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK.	The DNA for the participating Parties are: India: Ministry of Environment and Forest. Italy: Ministry for the Environment and Territory, Department for global Environment, International and Regional conventions.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK.	Host country India ratified the Kyoto Protocol on 26 August 2002 and the Annex I Party, Italy ratified the Kyoto Protocol on 31 May 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	NA	Italy's assigned amount is 92% of the emissions levels of 1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	NA	Italy has in place a national system for estimating GHG emissions and a national registry.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1 It is confirmed that the project is not a de-bundled component of a larger project.

Requirement	Reference	Conclusion	Cross Reference/ Comment
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The project design document conforms to the small scale design document format.
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK.	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK.	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK.	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD was published on <a href="http://www.dnv.com/certification/ClimateChange">www.dnv.com/certification/ClimateChange</a> , and Parties, stakeholders and NGOs were invited through the UNFCCC CDM website to provide comments on the validation requirement during a period of 30 days, commencing 21 April 2006. No comments were been received.

**Table 2 Requirements Checklist**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A. Project Description</b> The project design is assessed.					
<b>A.1. Small scale project activity</b> It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR/I	Yes. The project qualifies as a small scale project of Type II sub category D ie. Energy efficiency and fuel switching measures for industrial facilities.  However, the total energy saving by the project indicated as 44.37 GWh <sub>th</sub> in page 6 and 43.73 GWh <sub>th</sub> in page 9 are contradicting and need to be corrected.  Moreover, the evidence for name plate brick/ block production capacities of all the 14 plants in m3/ year needs to be provided.	<del>CL-1</del>	OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	It has been evidenced that the project is not a de-bundled component of a larger project.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	Yes. The project activity confirms to the project of category II and sub category D as defined for the small scale CDM projects, as the project activity envisages complete elimination of fossil fuel combustion as required in burnt clay brick production. Moreover, the appropriateness of the category has been confirmed by the Small Scale Working Group (SSSWG) of UNFCCC, as per Annex 5 of the PDD.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A.2. Project Design</b> Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR & I	Yes, The small scale project is located in a cluster of 14 plants in various districts in Andhra Pradesh state of South India. Each of the plants is identified by a tag number. Each plant in the cluster will have a storage yard for raw materials, pan mixer, casting machine, drying yard and curing yard.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR/I	Yes. The project's system boundaries have been clearly defined. Each of the plant in the cluster will have a raw material storage shed for the storage of raw materials like fly ash, lime and gypsum and also have pan mixer for efficient mixing of raw materials, casting machine for the bricks moulding and a drying and curing yard.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR/I	<p>The project design engineering reflects current good practices. The project activity is based on the new technology developed in India by the Institute of Solid Waste Research and Ecological Balance (INSWAREB).</p> <p>However, evidence is to be provided on the uniqueness of the technology and the number of plants in existence using this technology Since the project activity is the application of the FaL-G technology it is to be confirmed that all the plants in the bundle will use the fly ash, lime, gypsum route only.</p>	<b>CL-2</b>	OK
A.2.4. Will the project result in technology	/1/	DR	Since the technology was developed in India the		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
transfer to the host country?			project will not result in any technology transfer.		
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The project activity is based on new technology, which requires capacity building and training of the artisans for starting and maintaining of the production. However, the project does not indicate any action plans or provisions for the capacity building and training of the operating and monitoring personnel. This is to be clarified.	<del>CL-3</del>	OK
<b>A.3. Contribution to Sustainable Development</b> The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project will significantly reduce the consumption of fossil fuel and biomass in addition to the reduction of anthropogenic emissions of GHG. The project will also encourage effective utilisation of industrial wastes like fly ash as raw material and also lead to conservation of soil which is used as raw material for making clay bricks.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	No the project is not expected to create any adverse environmental or social effects. The environmental and social review (ESR) plan prepared by the project proponent will be applied for each of the units in the bundle. This is to be confirmed.	<del>CL-4</del>	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	I	The host country's approval for the project is awaited.	<del>CAR-1</del>	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	There are no relevant legislations that makes replacement of the of burnt clay brick manufacturing with FaL-G bricks or blocks mandatory in the host country.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>B. Project Baseline</b> The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
<b>B.1. Baseline Methodology</b> It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	Yes. The project applies one of the simplified baseline methodologies category AMS-II.D energy efficiency and fuel switching measures for industrial facilities. The project activity envisages complete elimination of fossil fuel combustion as required in burnt clay brick production. Moreover, the appropriateness of the category has been confirmed by the Small Scale Working Group (SSSWG) of UNFCCC, as per Annex 5 of the PDD.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes. The baseline methodology for Type II, Category D – energy efficiency and fuel switching measures for industrial facilities is applicable to the project activity. The aggregate energy saving due to the project activity is less than the stipulated 45 GWh <sub>th</sub> /year.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>B.2. Baseline Determination</b>  It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/	DR/I	<p>The additionality of the project is being established on the technological, prevailing practice and market acceptance barriers.</p> <p><i>Technological barriers: The project faces technological barrier due to the following reasons.</i></p> <ul style="list-style-type: none"> <li>▪ The technology being new, the requirements of capacity building and training to the work personnel for starting and maintaining production is perceived as a barrier.</li> <li>▪ The success of the technology depends on the mixing proportions of the raw-materials which again depend on the purity. Since the technology requires raw materials of specified purity the site location of the plant, the sourcing and procurement of raw materials and testing for purity is also perceived as a barrier.</li> <li>▪ The FaL-G brick technology also requires an accurate recipe control of the key raw materials in order to achieve the required strength. The recipe control needs changes in case of changes in the purity of the raw materials and hence needs technical knowledge and skills in comparison to the traditional brick manufacturing process. This is also perceived as a major barrier for setting up a FaL-G unit.</li> </ul>	CL-9	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p><i>Prevailing practice barriers:</i></p> <ul style="list-style-type: none"> <li>It is argued that the burnt clay bricks continue to be the most popular and low cost form of walling material for building construction in India and that, it accounts for about 95% of the market share. In comparison the FaL-G production including the fly ash brick production accounts for only 1.4 %. The source of the data presented in page 9 is to be evidenced.</li> </ul> <p><i>Market acceptance barriers:</i></p> <ul style="list-style-type: none"> <li>The market acceptance of the FaL-G brick due to the grey colour and the presence of the fly ash in the bricks create a barrier in terms of low consumer acceptance. The results of the market surveys conducted by the individual promoters of FaL-G technology are to be evidenced to justify the barriers of market acceptance.</li> </ul>		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	Yes, the baseline methodology chosen is the production of burnt clay bricks. The methodology has been applied in a transparent and conservative manner.		OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	There are no national or sectoral policies applying to this project activity.		OK



Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR/I	<p>Yes the baseline selection is compatible with the available data. However, the clarification is required on the following:</p> <ul style="list-style-type: none"> <li>▪ Evidence on the data indicating market share of different walling materials, particularly market share of burnt clay bricks in India (around 95%) needs to be provided.</li> <li>▪ Market survey conducted by various promoters indicating low consumer acceptance of the grey coloured FaL-G bricks.</li> <li>▪ Evidence on the data on "Energy consumption of different types of brick kilns in India" (as per table 1.2, section B.5. of the PDD) needs to be provided to DNV as the internet link is not working.</li> </ul> <p>Evidence to be provided on the weight of brick of dimensions 22cm, 10cm and 7cm to be 2.77 kg.</p>	<b>CL-4</b>	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes, the selected baseline of production of burnt clay bricks represents the most likely scenario that would have occurred in the absence of the project activity.		OK
<b>C. Duration of the Project / Crediting Period</b> It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	DR & I	Yes. The project's starting date is 1 <sup>st</sup> January 2003. The expected operational lifetime of the project is 15 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of	/1/	DR	The crediting period chosen is a fixed crediting period of 10 years and the start of the crediting		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?			<p>period is 1<sup>st</sup> April 2004.</p> <p>Even though the PDD for the project was prepared and offered for validation after 31<sup>st</sup> December 2005, the project can be considered as a prompt start project based on the COP/MOP decision that "project activities that started in the period between 1 January 2000 and 18 November 2004 and have not yet requested registration but have either submitted a new methodology or have requested validation by a designated operational entity by 31 December 2005 can request retroactive credits if they are registered by the Executive Board by 31 December 2006 at the latest".</p> <p>It was verified that the project proponent was in the process of having a discussion with the Small Scale working group of UNFCCC regarding a new methodology for the project and was recommended to use the AMS II D methodology. The necessary documents were evidenced. Hence the project can be considered as prompt start CDM project.</p>		
<b>D. Monitoring Plan</b> The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
<b>D.1. Monitoring Methodology</b> It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in	/1/	DR	Yes. The selected monitoring methodology is as		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
line with the monitoring methodologies provided for the relevant project category?			per the monitoring methodology for projects in category II.D for small scale projects, and involves metering the energy use of equipment installed and calculating the energy savings.		
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	<p>The application of the monitoring methodology is transparent and involved the monitoring of the following parameters in each of the units.</p> <p>a) The production rate and product dimensions are measured manually on daily basis to arrive at the monthly production as m3 of bricks/month</p> <p>b) electricity consumption by energy meter-monthly.</p> <p>c) diesel consumptions in liters -monthly.</p> <p>The data will be recorded at the individual plant and reported to ECPL who will archive the data till two years after the end of the crediting period.</p>		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes.		OK
<b>D.2. Monitoring of Project Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the	/1/	DR	Yes, as per the monitoring plan the electricity and diesel consumption in each of the units will be monitored for the estimation of the project	<b>CAR-2</b>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
project boundary during the crediting period?			emissions during the crediting period. However the indirect emissions in the project activity due to the transportation of the raw materials have not been considered on grounds that these emissions occur in the baseline also. The magnitude of the emissions is to be justified in the PDD for the project and in the baseline case.		
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Yes. The project considers the CO <sub>2</sub> emissions from the combustion of fossil fuel / from electricity use for the project activity. These are reasonable.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes		OK
<b>D.3. Monitoring of Leakage</b> If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No, there will not be any leakages.		OK
<b>D.4. Monitoring of Baseline Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline	/1/		The baseline emission during the crediting period are estimated as the product of the bricks manufactured and the specific energy consumption		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
emissions during the crediting period?			of burnt clay bricks, which has been arrived at 0.00261 TJ/M <sup>3</sup> of brick, as a weighted average of bricks manufactured by different processes and the specific energy consumptions.  Yes, the monitoring plan provides for the collection and archiving of all relevant data (like the bricks production) for determining the baseline emission during the crediting period.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes.		OK
<b>D.5. Project Management Planning</b> It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Yes. The authority and responsibility of the project management is defined.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	Yes.		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR & I	Procedures for training have not been indicated in the PDD.	CL-6	OK
D.5.4. Are procedures identified for emergency preparedness for cases where	/1/	DR & I	There are no situations that can create unintended emissions.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
emergencies can cause unintended emissions?					
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR & I	Procedures for calibration of monitoring equipment have not been indicated in the PDD.	<del>CL-6</del>	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR & I	Procedures for maintenance of monitoring equipment have not been indicated in the PDD.	<del>CL-6</del>	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR & I	Procedures for maintenance of monitoring equipment have not been indicated in the PDD .	<del>CL-6</del>	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR & I	Yes.		OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Yes.		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Yes.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	Yes.		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>E. Calculation of GHG emission</b> It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
<b>E.1. Project GHG Emissions</b> The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	No. The following aspects related to the project emissions needs clarification: Same as D.2.1: The emissions from transportation of raw materials to site of Fal-G plants are not considered and PDD is silent about the analysis of the distances covered in transport of raw materials in project and baseline scenario..	<b>CAR-2</b>	OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?		DR	As in E.1.1.		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?		DR	The emission factor for electricity is taken as 0.9 tCO <sub>2</sub> / MWh. The selection of this value is to be justified in comparison with the emission factor of the southern regional grid. The IPCC emission factor for diesel has been considered at 0.0032 t CO2/liter and is justified.	<del>CL-7</del>	OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes, the calculations with respect to the direct emission are complete.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.1.5. Have conservative assumptions been used?	/1/	DR	Same as E.1.3.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	Yes.		OK
<b>E.2. Leakage</b> It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.	/1/				
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	No, leakages are not to be considered.		OK
<b>E.3. Baseline GHG Emissions</b> The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.	/1/				
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?		DR	The baseline emission boundaries have been clearly defined and cover all sources for baseline emissions.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes, all aspects related to the direct and indirect emissions have been captured in the design.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes, the relevant GHG is carbon-dioxide and it has been considered.		OK



Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes, the methodology for calculating the baseline emission complies with existing good practice.		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes. The calculations are documented in a transparent manner.		OK
E.3.6. Have conservative assumptions been used?	/1/	DR	Yes		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Yes		OK
<b>E.4. Emission Reductions</b> Validation of ex-ante estimated emission reductions.	/1/				
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Yes, the project will result in fewer GHG emissions than the baseline case. The project activity is expected to reduce on an average 14162 tCO <sub>2</sub> /year.		OK
<b>F. Environmental Impacts</b> It is assessed whether environmental impacts of the project are sufficiently addressed.	/1/				
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR	No, India does not require an analysis of the environmental impacts for the project activity.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	I	The environmental clearances issued by the respective pollution control boards for each of the FaL-G units in the cluster are to be evidenced. While it is evidenced that 12 units have valid / provisional no objection certificates (NOC), Two	<del>CL-8</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			units (6 and 7) had no NOC's available. These are to be evidenced.		
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	Though the project has significant environmental advantages over the conventional brick manufacturing process, it however leads to air pollution due to stone, fly ash and cement dust emanating during transportation and from storage areas. However, the project has management plans in place to control the air pollution.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	I	Yes. Environmental impacts have been addressed in the PDD. The Project proponents have developed environmental management plans/ good practice manual to control the air pollution. These have been evidence during the site visit and are in order.		OK
<b>G. Comments by Local Stakeholder</b>					
Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	The project proponent has identified and consulted relevant stakeholders to the project activity either through organising workshops and/or formal/ informal consultations at a number of sites.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Same as G.1.1.		OK
G.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 regulations/laws?	/1/	DR	Stakeholder consultation process is not required for such a project by the regulations in India.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G.1.4. Is a summary of the comments received provided?	/1/	DR/ I	Yes. The summary of the comments received has been provided in the PDD. Most of the comments received were positive except from the local residents regarding the dust emanation during the transportation and handling of the raw materials.		OK
G.1.5. Has due account been taken of any comments received?	/1/	I	Due account has been taken for reducing the dust emanation problem by handling the raw materials in wet condition.  The site condition was verified for dust problems and found to be OK.		OK

**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response (WBCFU)	Final conclusion
<b>CAR 1:</b> Written approval from DNA of Italy and India still to be provided to DNV.	Table 1/ S.No. 4	Both have been received and submitted to DNV. Also attached the Written Approval from Netherlands. <b>[Annex 1(a) to 1(c) of PDD]</b>	Netherlands has to be added to the section A in the PDD and the LoA sent to DNV. The CAR 1 is closed.
<b>CAR-2</b> The indirect emissions in the project activity due to the transportation of the raw materials have not been considered on grounds that these emissions occur in the baseline also. The magnitude of the emissions is to be justified in the PDD for the project and in the baseline case	D.2.1	The details of transport emissions for the project and baseline have been already submitted.	This is seen in the revised PDD and accepted. The CAR 2 is closed.

<p><b>CL 1:</b></p> <p>The total energy saving by the project (indicated as 44.37 GWh<sub>th</sub> in page 6 and 43.73 GWh<sub>th</sub> in page 9) are contradicting and need to be corrected.</p> <p>Moreover, the evidence for name plate Brick/Block production capacities of all the 14 plants in m3/ year needs to be provided.</p>	A.1.1	<p>As per computation total energy saving is 43.73 GWh<sub>thermal</sub>.</p> <p>Thus the value in page 9 is correct and the value in page 6 is corrected in revised PDD.</p> <p>In highly mechanised plants, where unit operations are totally mechanised, the operational efficiency of the machine decides the capacity or output that can be notified as nameplate capacity. In the case of FaL-G, where the operational efficiency of human inputs governs the output of finished products, the nameplate capacities vary widely, thus proving them undependable. For example, on a typical casting machine for the same duration of activity, the output ranges between 10 m3 to 16 m3 depending on the operational efficiency of group working on it. Moreover some MIPs may put to operation different type of machines for different durations within the same project boundary.</p>	<p>The revised PDD incorporates the correction.</p> <p>The CL 1 is closed.</p>
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<p><b>CL-2:</b></p> <p>Evidence is to be provided on the uniqueness of the technology and the number of plants in existence using this technology. Since the project activity is application of the FaL-G technology, it is to be confirmed that all the plants in the bundle will use the fly ash, lime, gypsum route only.</p>	<p>A.2.3.</p>	<p>FaL-G technology is developed in two approaches, viz. "FaL-G in lime route" and "FaL-G in OPC route". The patent specifications on FaL-G covers both the approaches. Though FaL-G technology was primarily developed using lime, OPC was also identified as a source of lime to facilitate pozzolanic reactions in FaL-G system. . These approaches have significant bearing on technical point of view. INSWAREB has classified fly ash in to two varieties based on the sintering temperatures of coal in thermal plants and boilers. They are LT (low temperature) fly ash and HT (high temperature) fly ash. The research at INSWAREB established that LT fly ash goes well with lime where as HT fly ash goes well with OPC (pp. 28-30 Fly ash for Sustainable Development, the book authored by Dr Bhanumathidas and Kalidas; 2002). However in both the fly ashes either of the routes is interchangeable depending on the logistics of raw material availability and economics. This made the technology more flexible and adopt-friendly.</p> <p>Byproduct lime is available at almost 1/10<sup>th</sup> to 1/3<sup>rd</sup> of the mineral lime cost. Otherwise, It is economical to use OPC than mineral lime and, hence, OPC is preferred in areas where byproduct lime is scarce or not available due to profuse FaL-G activity. . In view of quality and logistical issues in procuring lime many entrepreneurs adopt FaL-G in OPC route</p>	<p>The revised PDD incorporates the explanation which is satisfactory.</p> <p>The CL 2 is closed.</p>
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<p><b>CL-3</b></p> <p>The project does not indicate any action plans or provisions for the capacity building and training of the operating and monitoring personnel. This is to be clarified.</p>	A.2.5.	<p>INSWAREB is the technology source and already the practice is in vogue to train the entrepreneurs as well as their production personnel while transferring the technology.</p> <p>The role of INSWAREB, as mentioned in B5 and D6 of PDD, is to determine the baseline and Monitoring methodology. Thus INSWAREB would impart training to the monitoring personnel of ECPL. It has already been informed that there are Board minutes on both sides (Eco Carbon Pvt Ltd, the Project Entity and INSWAREB, technology promoter) to cover these activities and to have mutual cooperation. A suitable agreement between INSWAREB and ECPL would be signed once the PDD and subproject agreements are finalised.</p>	<p>The explanation provided is accepted.</p> <p>The CL 3 is closed.</p>
<p><b>CL-4</b></p> <p>As the project is not expected to create any adverse environmental or social effects, the environmental and social review (ESR) plan prepared by the project proponent will be applied for each of the units in the bundle. This is to be confirmed.</p>	A.3.2.	<p>The ESR is already designed, and the salient points are mentioned in the PDD. The features of ESR would be covered in sub-project agreement, to be exchanged between Project Entity and sub project entity (SPE). Accordingly the SPE has to implement the plans of ESR, which would be periodically monitored by Project Entity. Disciplinary actions would be taken if SPEs prove as non-compliant.</p>	<p>The ESR document has been reviewed and found satisfactory.</p> <p>The CL 4 is closed.</p>

<p><b>CL-5</b></p> <p>A clarification is required on the following:</p> <ul style="list-style-type: none"> <li>▪ Evidence on the data indicating market share of different walling materials, particularly market share of burn clay bricks in India (around 95%) needs to be provided.</li> <li>▪ Market survey conducted by various promoters indicating low consumer acceptance of the grey coloured FaL-G bricks.</li> <li>▪ Evidence on the data on “Energy consumption of different types of brick kilns in India’ (as per table 1.2, section B.5. of the PDD) needs to be provided to DNV as the internet link is not working.</li> </ul> <p>Evidence to be provided to DNV on the weight of brick of dimensions 22cm, 10cm and 7cm to be 2.77 kg.</p>	B.2.4.	<p>World Bank has sponsored a study to Holtec who have discussed all these aspects in their report. Hence the same be referred.</p> <p>Please refer Holtec report.</p> <p>The information has already been provided and attached once again.</p> <p>Please refer Holtec report.</p>	<p>The information was verified with the report provided.</p> <p>The CL 5 is closed.</p>
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<p><b>CL-6</b></p> <p>A clarification is required on the following:</p> <ul style="list-style-type: none"> <li>▪ Procedures for training have not been indicated in the PDD.</li> <li>▪ Procedures for calibration of monitoring equipment have not been indicated in the PDD.</li> <li>▪ Procedures for maintenance of monitoring equipment have not been indicated in the PDD.</li> </ul>	<p>D.5.3, D.5.5. and D.5.6.</p>	<p>The monitoring personnel would be provided with templates those cover various data to be monitored, which would be duly filled by them. The steps involved in monitoring are simple and not covered as a special item.</p> <p>The salient feature of the project is total avoidance of thermal energy. Thus the fuel, conserved with reference to baseline, is taken to compute emission reductions.</p> <p>To monitor the project emissions for using electricity/diesel, D3 of PDD discusses the data to be monitored.</p> <p>This is a tiny sector activity involving no monitoring equipment in production front.</p>	<p>The explanation is deemed satisfactory, and the CL 6 is closed.</p>
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<p><b>CL-7</b></p> <p>The emission factor for electricity is taken as .9tCO<sub>2</sub>/MWh. The selection of this value is to be justified in comparison to the emission factor of the southern regional grid.</p>	<p>E.1.3</p>	<p>0.9 ton CO<sub>2</sub>/MWh is taken in accordance to the provisions of approved methodology for Type II, II D., which facilitates to use IPCC default values <u>vide clause 4 of Baseline in II.D.</u></p> <p>Data were submitted along with detailed break up of types of power generated in southern grid. The same is attached once again. As observed from data, the power generation through thermal + gas did not cross 56% either in a state or total southern region. This means, only 56% of the power consumption in the project of FaL-G brick plants should be computed for emissions. However, as a conservative approach for submitting data in PDD, total power consumption has been accounted for thermal.</p> <p>Either way, the CO<sub>2</sub> emission quantities computed based on IPCC default values offer conservative figures.</p>	<p>The value of 0.9 t CO<sub>2</sub>/MWh is accepted as conservative considering that the grid emission factor for the Southern regional grid, where the unit are located and draw power from is in the range of 0.85 T CO<sub>2</sub>/MWh when computed for the years 02-03, 03-04 and 04-05. The units also consume a very small quantity of electricity.</p> <p>The CL 7 is closed.</p>
<p><b>CL-8</b></p> <p>The environmental clearances issued by the respective pollution control boards for each of the FaL-G units in the cluster are to be evidenced. While it is evidenced that 12 units have valid / provisional no objection certificates (NOC), Two units (6 and 7) had no NOC's available. These are to be evidenced.</p>	<p>F.1.2.</p>	<p>The NOC of Unit 7 has already been submitted.</p> <p>Unit 6 has been replaced by a new unit (AP/KRIS/I/6) of same capacity, which is equipped with all the clearances.</p>	<p>The environmental clearances were evidenced and found to be in order.</p> <p>The CL 8 is closed.</p>

<b>CL-9</b> The source of the data presented in page 9 of the PDD is to be evidenced. <i>Market acceptance barriers:</i> The market acceptance of the Fal-G brick due to the grey colour and the presence of the fly ash in the bricks create's a barrier in terms of low consumer acceptance. The results of the market surveys conducted by the individual promoters of FaL-G technology are to be evidenced to justify the barriers of market acceptance.	B.2.1	This is covered in Holtec report already provided by World Bank.	The data source was evidenced and found OK The CL 9 is closed.
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